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THE RELATION BETWEEN CAPITAL AND AMOUNT OF GAS SOLD PER ANNUM.

There is probably no greater drawback upon the efforts of the gas maker to supply a good illuminating gas, at a low price, than that presented by the fact that in almost every company the amount of capital stock under which they are working is so much larger than is absolutely necessary that it absolutely amounts to a heavy handicap upon the very best efforts of the manager, and adds to the cost of production a sum far above that which should be legitimately required for profit.

Mr. George Livesey, in speaking before the British Association of Gas Managers in 1878, enunciated a few general principles upon this subject which it would be very wise for us to bear constantly in mind, and to keep them before the minds of those who control these matters. For this valuable paper in full we refer our readers to p. 107, vol. xxix (Sept. 2d, 1878.) Capital is thus defined:

"Capital may be defined as money represented in productive works, or used in working business. There is a vast amount of so-called capital which is unfortunately represented by nothing at all. * * * * There is an enormous amount which goes by the name of capital, although it stands for nothing but money spent in fruitless contests, in waste of various kinds, mistakes and extravagance on works that are obsolete or worn out, and on works that now have no existence. * * * * So long as a concern is able to pay interest on its nominal capital, it is assumed that the capital is represented, and it has a market value; but I hold that the *only sound position is that the works and plant should be fully worth at all times the sum charged against them in the capital account.*"

This position in any personal business would be considered self-evident, and the duty of every one having charge of corporate property is to place the business upon this footing at the earliest possible moment. When capital account is overcharged it should be purged of every item not represented by tangible value in works, plant, etc. It is a debt contracted for which there is nothing to show, and the gas maker should not be called upon to pay interest on that debt, nor should the interest be charged to the consumer.

The question naturally arises—"how much is a proper amount of capital for a company to have?" Everyone recognizes the advantage of small capital; but how small should it be? In a general way, we have no doubt but that $5 per thousand feet of gas sold per annum is ample for moderately-sized works. Mr. Livesey goes into the details of this question, so far as the conditions in England are concerned; and from a number of cases cited, and a large number of other cases coming within his own personal knowledge, he lays down the principle that £5, or $25, per ton of coal carbonized per annum is ample; or, estimating the sales at 9,000 feet per ton, this gives 11 shillings ($2·75) as the amount per 1000 feet sold per annum, and he divides this amount into three items, viz., works, per 1,000 feet sold, 6s. 8d., mains, etc., 3s. 4d., working capital, about 1s. These are figures given by one having long and varied experience; and, in his own case, they are not theoretical, for the South Metropolitan Company, of London, of which he is the Manager and Engineer, has capital to the amount of 10s. 1d. per thousand feet sold last year; and though the other companies of London are not quite so fortunate still they do not differ so very widely as to shake confidence in the rule. The capital employed, per 1000 feet sold, by each of the six companies, for the past five years, is as follows, as shown by the tables compiled by Mr. John Field for the year 1878:

Year.	Gaslight. (Chartered)	Commercial.	London.	Phœnix.	South Metropol.	Surrey Cons.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1874	19 0	10 11	18 1	16 8	10 2	15 2
1875	18 1	10 5	17 1	15 9	10 5	14 2
1876	17 1	11 4	15 1	14 7	10 6	13 2
1877	16 11	11 10	14 11	14 7	10 4	12 7
1878	16 5	11 0	13 9	14 1	10 1	11 6

Some of the larger capitals are the direct result of competition so-called, and it will be some time before the evils created thereby can be overcome. Opposition means waste and loss that must ultimately fall on the consumer, for it is the selling price of gas that must cover cost of manufacture and interest on capital. These figures give the facts as regard some of the best managed companies in England, and they could be extended indefinitely. As to our own country it is not so easy to arrive at definite figures and statistics, as none are published, even if they are kept, by the companies. But go where one will in this country it will be found that the most prosperous companies are those who are least burdened with capital. Several might be mentioned whose capital per thousand feet of gas sold per annum is below $5; and in almost every case of this kind it will be found that works and

plant exist equal in value to every dollar of capital. Happy should be the manager of such a company.

It may be said that prices of everything in England are so different that we cannot be guided by their figures. From Mr. Fields' tables we extract the following items, which each manager may compare with his own prices, and see just how far one may be guided by them. The prices given are all reduced to *cost per thousand feet of gas sold.*

1st. Net cost of coal.—Cost of coal, 19·58 pence. The receipts for residuals were for coke and breeze, 6.65 pence; for tar, 1.95 pence; for ammonia, 2.37 pence, making a total of 10.97 pence, which gives for the net cost of coal per thousand feet of gas sold, 8.61 pence, or about 17 cents.

The cost of gas delivered, or, as they call them, "working expenses," are divided as follows: 1st. Manufacturing charges; 2d., distribution; 3d., rent and taxes; 4th., management. Added to these are the items for law charges, bad debts, public officers and testing officers, depreciation on works on leasehold, pensions, and other charges.

The first includes purifying, 1.03 pence; salaries at works, 0.45 pence; carbonizing wages, 3.83 pence; wear and tear, 5.59 pence, making total under this head 10.90 pence. The next item, distribution, includes salaries and wages, 0.76 pence; wear and tear, 1.63 pence, total, 2.39 pence. Rent and taxes amount to 1.56 pence.

Management expenses were as follows: Directors and auditors, 0.31 pence; salaries, 0·31 pence; collectors, 0.54 pence; stationary and general charges, 0.28 pence, making total of 1.44 pence. Law charges were 0.07 pence; bad debts, 0.18 pence; testing offices, etc., 0.04 pence; depreciation of works on leasehold, 0.03 pence; other charges, 0.28 pence; total "working expenses," 16.89 pence, which, added to net cost of coal, gives 25.5 pence (or 51 cents) as the cost for coal and working expenses.

The net receipts for gas were 41.44 pence, leaving a profit of 15.94 pence, to which other miscellaneous receipts, meter rent, etc., amounting to 0.22 pence, are added, making 16.16 pence, from which interest on borrowed monies and insurance, amounting to 1.39 pence, is deducted, leaving the net profit per thousand feet of gas sold at 14.77 pence. The amount required for standard dividend is 13.37 pence, leaving 1.40 pence for extra dividend and surplus.

By simply multiplying these figures by two, the amounts are converted into cents, and any one can compare them, item by item, with his own workings. In a majority of cases it will be found that the making of the dividend is the real obstacle to reduction in price; and the reason that such is the case is simply that the capital is larger than is honestly required for the business.

We are on the verge of an era of prosperity that bids fair to equal any yet known. It is useless to go on encumbered with watered capital and a load of bonds that represent nothing but "the great Divide."

It behooves every company to determine now what their works, plant, etc., are really worth *to-day*, rearrange their capital on that basis, and, equipped as light weights, go into the coming race for remuneration and profit free from all encumbrances; and thus prepared to meet all reasonable demands for reduction in price seek, by every legitimate means, to extend their business in every department of life. The result will soon be evident. Reduced cost of production, reduced cost to the consumer, and much more satisfactory relations between producer and consumer, united with surer and better returns on the capital invested.

OBITUARY.

It is with sincere regret that we learn that Mr. George Buist, Manager of the Halifax, Nova Scotia, Gas Light Company, died on the 2nd inst. The American Gas Light Association loses a valuable member, and all will join in extending to the relatives of Mr. Buist their most sincere sympathy in their affliction.

He was a thorough gas engineer who believed that the correct application of true principles would lead to good results; and, acting on this belief, his management has been a success, and his loss will be keenly felt by his company.

A Modest Claim.

To the Editor of the Brooklyn Eagle:—The latest phase in the proposed consolidation of the gas companies is a demand made by the principal mover in the job, for a commission for his services in securing the stockholders of the following companies a reduction in value of their property:

Peoples' Company.....	$700,000	Williamsburgh Co.....	250,000
Nassau Company.....	400,000	Citizens' Company.....	100,000

Total reduction, $1,450.00; commission (4½ per cent.), $60,175. This modest demand is only equalled by a claim for $25,000 put in by the representative of the Fulton Municipal Company. Both of these requests have been referred to the directors of the Consolidated Co. X.—*Brooklyn Eagle.*

Competition and its Results.

As a matter of interest at the present time, in connection with the proposed consolidation of the Brooklyn companies, we give the following, which appeared in the Brooklyn *Eagle*, in January, 1876.

It is good evidence, and shows exactly the usual promises made to get a foot hold.

The consolidation, if carried out, only gives about a million and a quarter to the heirs, assigns, successors, etc., of the Mutual company then being born.—Ed.

Brooklyn, January 15, 1876.

To the Honorable, the Common Council of the City of Brooklyn:

Gentlemen—I have the honor to inform your Honorable Body, that the undersigned represents a company composed of the citizens of the city of Brooklyn, which has been organized under the general laws of the State of New York, passed February 16th, 1848, and intended for the purpose of manufacturing illuminating gas in the city of Brooklyn, said company is known and designated as the Mutual Gas Light Company of the city of Brooklyn, state of New York, and in pursuance thereof, I respectfully make application to your Honorable Body for permission to open the streets and avenues of said city for the purpose of laying gas mains and conduits to enable our company to accomplish the objects of its organization. Should your Honorable Body grant us this privilege we will furnish gas to the people of the city of Brooklyn of an illuminating power equal to twenty (20) candle light, at a reduction on their bills of at least twenty (20) per cent. less than the present proposed reduced rates of our city gas companies.

We will furnish and set the meters, lay the service pipe, and connect the same with the pipes in the buildings free of all cost to the consumers. We claim that our fellow citizens should have the right and benefit of persistent competition as the only means of obtaining better and cheaper gas. We also respectfully represent that the removal of upward of three thousand (3000) gas meters from the houses of gas consumers in this city within the four months last past indicates a degree of necessity for cheaper and better light by the people that cannot be wisely disregarded by your Honorable Body, and to that end we will give such security and assurances as your Honorable Body may suggest as a guarantee of our good faith, as well as of our ability to maintain a company that will successfully compete with all opposition for the privilege of supplying a cheap and superior quality of gas to the people of Brooklyn.

The Mutual Gas Light Company of the City of Brooklyn, by

[Signed] Ward B. Meeker,
President.

[Official Notice.]

The Third Quarterly Meeting of the Central New York Gas Engineers Association will be held in parlor "A," Brackett House, Rochester, New York, on Thursday, November 20th, 1879, at 11 o'clock, A.M.

The importance of these meetings cannot be too highly estimated, and the results emanating from the papers read, and the discussions upon them by the members, has already proved a profitable source of information to the companies who have been represented.

These meetings are especially beneficial to the smaller companies—who by necessity are compelled to use every means to reduce the cost of manufacture, as they have the benefit of the experience and manner of working of all other companies.

The expenses attendant upon the meetings are very light, and cannot be set up as a bar to the admission of any company.

It is earnestly hoped that every company, not already represented in the Association, will forward the name of some representative, preferably the superintendent, to the Secretary, at an early date; and that their representative be present at the opening of the Convention.

A paper will be presented by Mr. A. D. Perry, of Rochester, on the proper and legitimate means to be used in the extension of our business. Other papers will be read, and matters of importance to every gas company will come before the meeting.

The headquarters of the Association will be at the Brackett House, where special rates have been obtained for the benefit of the members.

It is desired that all who propose attending this meeting will promptly notify the Secretary, so that ample arrangements may be made for their accommodation.

Clement A. White,
Secretary.

The Electric Light at the British Museum.—It is the intention of the trustees of this institution to use the electric light in the reading room during the winter months, in order to extend the hours for readers, and to illumine the room in foggy weather. The system will be tried of a few lamps hung high above the floor level, and a diffusion of the light by reflectors. The arrangements will be directed by Messrs. Siemens Brothers.

Proceedings of the Seventh Annual Meeting of the American Gas Light Association.

HELD AT PHILADELPHIA, PA., OCTOBER 15, 1879.

[Continued from page 204.]

Mr. Nettleton—I am not aware that there are any other committees to report. I have here a communication to the President of the Association which I think it proper to read. It is from the Philadelphia Gas Trust, and is as follows:

Gentlemen:—We cordially extend to the American Gas Light Association an invitation to visit all the gas works in Philadelphia under the control of the Board of Trustees. Very respectfully,

THOS. NOBLE, Registrar.

Mr. Cartwright—I move that the invitation be accepted at the convenience of the members, and that the thanks of the Association be tendered for the invitation.

Carried.

Mr. Helme—It might be proper to say at this point that the Secretary of the Franklin Institute, before we convened here to-day, requested that I should extend to the members of the American Gas Light Association an invitation to attend their monthly meeting, which takes place in this room this evening, at 8 o'clock.

Mr. C. A. White—I move that the invitation be accepted at the convenience of the members, and that the thanks of the Association be tendered to the Secretary of the Franklin Institute for the invitation.

Carried.

Mr. Helme—I think the members will find the meeting here to be very interesting. The general order of business is first gone through with, and then various subjects, of a scientific nature and otherwise, are brought up, discussed, explained, and illustrated. I would state that at this time a year ago we were all interested and excited upon the subject of the electric light. We did not know exactly where we stood. Up to that time large gas burners had not been experimented with to any great extent. We all know that some experiments have been made in this direction upon the other side of the Atlantic, and some of the large burners that were used there have found their way to this country, and I desire to say, for the information of the Association that there is a large Wigham burner which was used on Westminster Bridge in competition with the electric light, and which was decided to be preferable to the electric light. It is put up at 1117 Cherry street, in this city, and will be burned this evening and next evening for the gratification of such members of the Association as wish to look at it. It is a 28-jet burner. They give it a measurement in London of 51.4 cubic feet per hour, and a power of 429 candles, cannel gas. It is a new thing to us, and in our tests we have only been able to pass about 35 feet, and it seems to give a candle power of about 250 or 275 candles. It will be burned to-morrow evening and every succeeding evening until 12 o'clock, at the point I have named, and if any one wishes to go and see how one of those burners operates, he will have an opportunity to do so. They claim to have taken photographs with them in London. The one I have spoken of, however, is not one of the largest. They have one of 48 burners, which I believe was used for that purpose.

The President—Undoubtedly every member of the Association will accept that invitation. It is very desirable to learn all we can about the new burners.

Mr. Helme—It merely serves to give us an idea of what may be accomplished in that direction. It is a large light, and certainly very much preferable to the electric light.

Mr. Neal—I move that we proceed to the election of officers.

REPORT OF COMMITTEE ON NOMINATION OF OFFICERS.

Mr. Wood—On behalf of the Committee on the Nomination of Officers, I beg leave to submit the following report:

The Committee recommend for President of the Association, W. H. Price, of Ohio.

For Vice-Presidents, Gen. A. Hickenlooper, Ohio; John P. Harbison, Connecticut; Geo. A. McIlhenny, D. C.

For Secretary and Treasurer, Wm. H. White, New York.

For Finance Committee, John S. Chambers, N. J.; Theobald Forstall, La.; A. B. Slater, R. I.

For Executive Committee, Henry Cartwright, Pa.; F. C. Sherman, Conn.; A. C. Wood, N. Y.; Geo. S. Hookey, Ga.; James M. Starr, Ind.; P. T. Burtis, Ill.

Respectfully submitted,

A. C. WOOD, THEOBALD FORSTALL,
GEO. DWIGHT, W. A. STEDMAN,
P. T. BURTIS, *Committee.*

Mr. C. A. White—I move that the report of the Nominating Committee be accepted and the Committee discharged.

Carried.

Mr. C. A. White—I move that the Secretary be authorized to cast the ballot of the Association for the gentlemen named by the Committee as officers for the ensuing year.

There being no objection, the Secretary then proceeded to cast the ballot of the Association for the gentlemen named as officers for the ensuing year. Major Dresser was appointed teller.

Mr. Wood—I trust that it is understood by the Association that General Roome and Mr. Nettleton both peremptorily decline re-election.

Major Dresser—Mr. President, the teller appointed to receive and count the votes of the Association for officers for the ensuing year, begs leave to report that he has examined the ballots, and has found the gentlemen whose names were presented by the Nominating Committee to be unanimously elected.

The President—I have been in very great doubt whether I ought to thank you for this election. I certainly do thank you, gentlemen of the Association, most heartily and sincerely for this evidence of your good will and esteem; but I felt very greatly inclined to go again into the ranks. I have reached an age when I have got beyond the petty ambition to occupy a conspicuous position. I would rather have had the opportunity to be at liberty to make motions and talk a little, than to be tied up as I am in this place. It may be, however, for the good of the Association that I am tied up in this way. I might talk too much, and make too many motions. Since, however, you have chosen me to occupy this position, I will endeavor to perform its duties to the best of my ability, and I desire once more to return my thanks for this expression of your preference. [Applause.]

PAPERS.

The President—The next thing in the order of business is the reading of papers.

Mr. C. A. White—As there are but a few minutes before the hour fixed for adjournment, I think it would be hardly proper to take up the reading of papers at this time. If a paper is read now, and we take a recess until 3 o'clock, many things which might present themselves to our minds as the paper was being read will have been forgotten during the intermission. It therefore seems to me to be proper to defer the reading of the papers until we assemble this afternoon. I think we had now better adjourn until 3 o'clock, unless there is something which requires our special attention.

Capt. White—Before that motion is put, I desire to say that I think the Association has overlooked one very important matter. The President and Secretary of this Association, who have served us so faithfully and acceptably for the past four or five years, now, of their own free will, retire from office. It seems to me, sir, that we are forgetting our manners if we allow these gentlemen to step down from the positions which they have filled from year to year to our honor and credit, without expressing to them our sincere and hearty thanks for the manner in which they have administered the duties, oftentimes onerous, of their several offices. I therefore move you, sir, that the thanks of this Association be tendered to the retiring officers—to our honored President, Gen. Charles Roome, and to our able and efficient Secretary, Mr. Charles Nettleton. [Applause.]

The President—I am sure that every member of the Association will respond most heartily to the motion that has just been made, and I am very glad that Capt. White has had the thoughtfulness to bring it to our attention. We certainly ought not to adjourn without expressing our high appreciation of the services rendered by the gentlemen who retire from office to-day. I am sure we will all of us gladly bear testimony to the high esteem with which we regard the honored gentleman who has so long filled the office of President, as well as to the efficient, zealous, and statisfactory manner in which the duties of Secretary and Treasurer have been discharged by the gentleman who now voluntarily retires from the office. I think that to him, perhaps, more than to any other man, is due in a large measure the success which has followed the organization of this Association. We have sometimes discussed our Secretary pretty freely—not in the way of criticism, but in the way of commenting upon the amount of compensation to which he was entitled for his services. A question has from time to time been raised in regard to the amount of his labors, but for my own part I do not think that the Association has ever really appreciated the amount of labor performed by our Secretary, and the obligations we are under to him for the very excellent position which we, as an association, occupy to-day. And while we all recognize and appreciate to the fullest extent the distinguished services which our President has rendered, I think we must all admit that to Mr. Nettleton, more than to any other man, is due the success which has attended our labors thus far. [Applause.] I am glad, gentlemen, that this expression of my sentiments meets with your approval. For my own part, I have never felt that the services of the Secretary have been very highly paid for; but in that I have had the misfortune to differ with

some of the gentlemen present. However that may be, I am sure they will agree with me that the duties of Secretary have been performed with a degree of excellence entirely beyond criticism. It is not for me, however, to say anything upon the subject of salary. If the Secretary is satisfied, we certainly ought to be.

It gives me great pleasure, gentlemen of the Association, to put the motion made by Capt. White, for I am sure that it meets with the most hearty and unanimous concurrence of every gentleman present to-day.

Mr. Neal—I suggest, Mr. President, that the thanks of the Association be tendered to these gentlemen by a rising vote.

The motion was adopted. Every member of the Association rose to his feet, and after the vote was taken there was loud and continued applause.

Mr. Nettleton—Gentlemen of the Association, if Gen. Roome were here, he could respond to the action you have just taken in language most fitting and eloquent. Although I belong to a talking profession nominally, talking in public has never been my forte. I can sometimes effect results by acts to my satisfaction, and I am happy to say, and I know you will understand me as saying it without egotism, that I am reasonably satisfied with the way I have performed the duties of Secretary and Treasurer of this Association. It is highly gratifying to me, gentlemen, to know that you are also satisfied with the manner in which these duties have been performed. The warm words of friendship which have been expressed by our President today come very close home to my heart, and I can say no more. I thank you. [Applause.]

Mr. Neal—Perhaps, as I am partly included in the resolution, I ought to express my thanks to the Association for the honor they have been pleased to confer upon me in allowing me to remain one of the Vice-Presidents of this Association, and also for the honor they have conferred upon me incidently, in the absence of the President and Vice-President, in allowing me to preside at the meeting in Cincinnati. We had a very delightful meeting, and were very handsomely treated by our friend Gen. Hickenlooper, Lieutenant-Governor elect of Ohio.

On motion, the Association then adjodrned till 3 o'clock P. M.

Afternoon Session.

The Association met at 3 o'clock, pursuant to adjournment.

The President—The first thing in order will be a report from the Executive Committee.

Mr. Neal—Mr. President, the Executive Committee have received applications from several gentlemen, and they recommend their election as members of the Association. [The names of the gentlemen were published on page 196.]

The President—We come now to the serious work of the meeting. We have several papers which have been prepared, and I will now call upon Mr. Sherman to read his paper upon the Relation of Municipalities to Gas Companies.

The paper was then read by Major Dresser, as follows:

The Relations of Municipalities to Gas Companies.

Within the past few years there has arisen in this country a class of individuals who wish to hurry up the millenium by attacking corporations of a semi-public nature. This feeling manifested itself in the labor riots of 1876, and is at present extremely popular in California. These outbursts are always originated by those who see a short road to wealth by dividing and distributing the savings of others. For political or other reasons, many respectable people join hands with them, and the consequence is that we already hear of a struggle between labor and capital.

That gas companies have received no little attention from these reformers, aided by many who bear honest convictions that a better state of affairs could be brought about, is evidenced by the slightest perusal of the daily press. Their absurd and foolish statements meet with a ready credence, as is demonstrated by the sympathy and aid extended to all attempts to establish rival companies.

Statistics abundantly prove that competition in the supply of such an article as illuminating gas cannot be sustained. Wherever it has been tried evils of a nature to more than counterbalance its good qualities have arisen. It has been necessary either to district the territory or absorb it. The people ultimately have to pay for the increased outlay necessary to cover the interest on two or more sets of mains and works, together with the watered capital. But few American cities are large enough to try the experiment, and if they were the experience of the largest cities of the old world would not sanction the attempt. It has been abandoned in every instance where tried across the Atlantic, the two most notable examples of which are to be found in London and Paris.

At one time there were fourteen companies in London. In 1860 each one was assigned a district, and since then, by amalgamation, the number has been reduced to five. Of the several companies which at one time existed in Paris but one now remains. The system of rivalry in the production of illuminating gas has been fully tried in New York State under the fostering influence of the Legislature. The result has been that, although two or more companies exist in nearly all the principal cities of that State, the cost to consumers exceeds that in cities which have but one company to support.

It is safe to estimate that more than double the amount of capital necessary to transact the business is invested in it in New York State, thus weighing it down in such a manner as to prevent its true development and growth.

To add to the difficulties, the unfriendly treatment which most companies receive from municipal corporations should be noticed. In most places they are barely tolerated; denied their rights in the streets; their mains and services injured, and leakage increased.

Again, in the matter of lighting the streets, the companies are crowded in the price below a living rate, and constant carping is indulged in both as to the quantity and quality of the gas furnished.

A partial remedy for this state of affairs can be found in a greater publicity in regard to our business, and leave the intelligent citizen to see for himself the hollowness of the arguments in favor of competing companies. The veil with which we have so carefully surrounded ourselves in the past is in a measure due to the opposition which we are now encountering. It has begotten suspicion and jealousy on the part of our consumers. It has led many to believe that our profits are too great to stand public scrutiny. The future safety of our investments in gas manufacture lies in taking the public into our confidence.

Our business in honorable and useful, and we have nothing that ought to be concealed. With very few exceptions, the customers of gas companies have been honorably dealt with, and the profits have not been more than the risks warranted.

In England, where this whole question has been thoroughly investigated, the companies are allowed by law ten per cent. dividends. An examination of the business in this country would reveal the fact that a ten per cent. dividend is not realized. The uncertainty that hangs over gas investments is an outgrowth of this hostility, engendered by ignorance of the business.

Where a company is prosperous, a constant effort is necessary to keep out opposition, and is often attended with great expense. From its very nature, it is necessary that the business should be a monopoly, but an enlightened self-interest demands that it be one regulated by law. Not only should our gas be subjected to inspection, but our investments, operating expenses, and profits.

This would do away with many of the complaints of our consumers, and insure us from competition. I am satisfied that we must come to this eventually in order to escape ruinous competition and the burdening of the public with the support of unnecessary capital.

Some of you may deny that we, the managers, have any interest in this subject; but self-interest, if no higher motive, ought to make each of us use his individual influence with his own company in seeking to bring about, in a quiet way, what may eventually be forced upon us in a burdensome form.

The reading of the paper was greeted with applause.

The President—I think our habit has been, after the reading of papers, to discuss the subject to which they relate, and we invite any remarks that gentlemen may feel inclined to make, either in the way of criticising the paper or giving expression to their own ideas in relation to the subject-matter of the article. It is probably best to pursue the same course in this case, and those members who have remarks to make will now proceed to occupy the time.

Mr. Neal—I think we all so heartily agree with the sentiments expressed by Mr. Sherman in that paper, that none of us have anything to say except to express our approval.

Mr. Stiness—If there are no remarks to be made upon that paper, and if we all agree with the views and conclusions of Mr. Sherman, as has been suggested by Mr. Neal, I move that the thanks of the Association be tendered to Mr. Sherman for the very clear and explicit manner in which he has presented his views.

Mr. Harbison—I hope some gentleman present will make some more extended remarks. What has been said by Mr. Neal and Mr. Stiness is, of course, very good as far as it goes, but it seems to me that the paper is worthy of more extended discussion.

Mr. C. A. White—It is something like a methodist meeting; we all say "amen."

Mr. McIlhenny—I came in just as the last of the paper was being read, and I do not know what the former part of it contained; but I hope that such a paper as that will not be allowed to pass without discussion. I hope the gentlemen of the Association who have heard the whole of the paper will express their views on the subject.

Mr. Littlehales—For my own part I must say that the paper to which we

have just listened is one that has given me a great deal of information and a great deal of pleasure. It seems to me that it is the key-note of the position in which the gas companies stand in regard to the price of gas. There is a great demand for a reduction in the price of gas all over the country, and that demand can only be complied with, it seems to me, by a little modification of the system that has been heretofore adopted in the conduct of gas companies.

When a company is chartered in Great Britain, it comes under the supervision of a special committee of the House of Commons which prescribes what the capital of the company shall be. The company is to show what amount of business it expects to do, what their coal and the different items which go to make their product will cost them, and their anticipated profits; in fact, they have to submit a prospective balance-sheet. After that is done the committee of the House of Commons decides what shall be the limit of the price, and fix the illuminating power and standard of purity. The Municipality has nothing at all to say in the matter. Parliament gives the charter, and all that the company has to do with the Municipality, and the only relation they sustain to it, is simply to give them notice of breaking open the streets. While the companies carry out the conditions imposed by Parliament, there is not the slightest chance of their having an excess of capital, or their being interfered with in any way by the Municipality. The tendency has been to restrict, as far as possible, the employment of capital so as to have the capital account in a low proportion to the make of gas. The result has been that gas is sold cheaper in England than anywhere else. The investment is perfectly secure, and the consumers, I suppose, are satisfied.

There are a great many considerations which bear upon this question which will have to be decided before any such regulation can be adopted here. The question naturally arises whether the same system can be adopted in this country. That, of course, is a question of legislation. If such legislation could be had in this country as would make the investment in gas companies secure and permanent, there would be some inducement for the companies to make their price lower and restrict their capital. It is, however, a very large and serious question to deal with, and I hope the matter will not be allowed to lie over, but that the question will be thoroughly ventilated. Until there is some uniformity in the legislation, it seems to me we will never reach the point of a reduction in the price that might be reached if proper legislation were secured.

Major Dresser—Upon the question of the protection which the law gives to gas companies in England, as mentioned by Mr. Littlehales, I would state that formerly. in Liverpool, there were two companies, and a third was projected. The two companies had been in opposition. An application was put in for the organization of a third company, and the promoters of it came before the Committee of the House of Commons for authority to raise capital and go on with the business. The other two companies, who had not been previously particularly friendly to each other, united for the purpose of opposing the organization of the third company and came before the committee for that purpose. The committee heard them all and, finally, said to the companies already existing what would amount to this—

"If you two old companies will arrange your differences and consolidate into one company, as you ought to do, we will take care that there are no more gas companies in Liverpool."

They did so, and Liverpool has but one company. That has been the custom in other cases since this legislation of the British Parliament has been adopted, and consolidation is going on all the time in England where several companies are doing business in the same place.

There is another point in connection with this subject, which Mr. Littlehales has also referred to, and it is one which comes pretty closely home to a good many gas companies in this country, and that is this matter of capital. I have reason to believe that some of the gentlemen who have read the Journal know pretty well what my views are on that subject. I have reason to believe that some of the gentlemen present entertain very decided views upon this question and that they are prepared to express them. There is, in my judgment, too much capital nominally in the business, even in many cases where there is but one company existing in one place; and, it seems to me, that there could be no better service rendered to the public, or the stockholders, or to this Association, than for this body of men to put their heads together and see if there is not some way by which the capital represented by the gas making interests of this country can be reduced to a reasonable basis, and to a just proportion to the amount of the business and to the value of their plant. When we get down to the point that an engineer of a gas company does not have to add a dollar to the cost of every thousand feet of gas sold, in order to pay a ten per cent. dividend, or, in other words, to a point where the capital of the company is reduced within reasonable limits, we will have arrived at a point, I think, where the reduction of the price of gas will be entirely practicable and profitable.

The trouble about the matter is that those who seek to bring about this change will encounter an opposition that will be very hard to overcome. When it is demonstrated to the satisfaction of the public, and to everybody that gas companies are not getting more than a fair price for their gas, and are not making exorbitant profits out of their business, nobody is going to put more money into it. I think it is a very important point, and that it deserves to be very carefully considered by the Association.

I hope you will excuse me for taking up so much of your time; but if this matter is going to be agitated at all, and if it is desirable, as it certainly is, that any reform should be brought about, it seems to me that this Association is better adapted to inaugurate such a reform, and to carry it into effect, than anybody else.

Mr. Coggshall—I think it is a very important subject; but, to my mind, the matter really rests with the gas companies themselves. If the stockholders of gas companies would be willing to reduce their capital, and be satisfied with a reasonable dividend of eight or ten per cent., with taxes paid, which is, to my mind, a dividend sufficient for any stockholder, I think the solution of the difficulty would be reached. As I say, in my judgment, the gas companies themselves have this question in their own hands. I would refer, as an illustration of that, to the gas company of the city of Lowell, which is represented here to-day. There they sell their gas at $1.80, and I should not be afraid to defy any competing company to come in there and locate. Opposition companies will not go to any such place as that. So that, if gas companies would consent to a fair and reasonable reduction of their capital, and would sell their gas at a low figure, and be satisfied with reasonable dividends, it does not seem to me that there would be any difficulty from competing companies. The gas company of Derby, Connecticut, is selling gas, for the size of the place, cheaper than any other company I know of in New England. If the stockholders of the gas companies could be brought to accept the situation, and to manufacture the gas as cheap as it could be manufactured, and sell it as low as it could be sold, there would be no danger of competition.

Mr. Stedman—Major Dresser has suggested that I should say something upon this point in connection with some statistics of several New England gas companies which have recently been collected. It seems to me the matter after all comes down to the question about "belling the cat" that we have all heard of. Who was going to bell the cat? Who will have the temerity to go to the stockholkers and say to them: "You have got too much capital. If you are willing to reduce the amount of your stock 33 per cent., and receive 8 or 10 per cent. dividends on the balance, over and above taxes, we can sell gas low."

Let me premise my remarks by saying, in the first place, that a good many New England gas companies are in the situation of having a very large plant put up by contractors who came in the town for the purpose of making a good pile of money. The works were put up, say, at a cost of $60,000, the builders receiving the stock of the company to the amount of $120,000, $130,000, or $150,000, and a large amount of stock would be issued. Then they would step out and would leave the stockholders to work out the problem of how to manufacture gas and how to sell it, so as to make a dividend on that large amount of capital stock. Having found themselves in a position of that kind, they put in a little water, so that the capital represents a very large amount per thousand feet sold. In the tabulated statistics referred to, we have the number of thousand feet sold by each company, also, the capital stock of each company, and a column showing what the amount of the capital stock is per thousand feet of gas sold per annum. This runs down as low as $1.90 per thousand feet of gas sold, and it runs up as high as $29 per thousand feet sold. So there is, as you will see, a great discrepancy in this respect, and you will also see from that statement what the possibility is of selling gas at a low rate by some of the companies, and, at the same time, make a fair return to the stockholders. The average, I think, is about $9 per thousand feet, or a little under. It is brought down to this low average on account of one or two large companies having a small average, and, of course, it makes the total average low. If you take out the two largest companies of New England, the average would run considerably higher—possibly, between $14 to $15.

I believe the time will come when we shall have the matter regulated by legislation very much as it is in England. But when we come to do it in that way, and our books and accounts are inspected, it may lead to a very considerable amount of criticism. People will say: "What does this $50,000 represent? Here is a statement of your books that a certain amount was divided among your stockholders. Does that represent $25,000 or $50,000 actually put into the company to enable them to enhance their productive power, and to decrease their cost of production? Or does it represent a fictitious value, something that was not actually put in?" Those are criticisms and questions that would undoubtedly be made and asked were our books and accounts open to the public.

I believe, Mr. President, that it would be of great advantage to the gas companies if they could satisfy the public that they were dealing fairly honestly with them. But where gas companies are in the position that I have referred to, where they have watered their stock, and where their stock

does not represent the actual value of their plant, and does not represent money actually put in, there will be, of course, some difficulty about having the matter made public, and there will be some natural repugnance to opening their books for the inspection of the public. But who shall have the temerity to bell the cat? Who shall have the temerity to go to the stockholders and say this dividend, this money that was given to you we could hardly afford to give. If you will adjust the amount of your stock, and put it upon a fair and reasonable basis, and establish a just proportion between the amount of capital stock and the value of your plant, we shall then be able to sell gas cheap, and pay 8 or 10 per cent. dividend upon the capital thus reduced. If stockholders could be brought to look at the matter in this light I think there would be little trouble; and, *after the change was made*, the stockholders would be better satisfied, and the consumers certainly much better satisfied. As I said before, I think the best interests of the gas companies would be served if the public were thoroughly convinced that they were fairly, and honestly and justly dealt with; and that the cost of production was as low as it could reasonably be made, and that gas was sold for only a fair margin of profit.

Mr. Harbison—I agree in part with what Mr. Sherman has said, and only in part. I think that a certain amount of publicity in regard to our affairs is right and proper, so far as the public is concerned. I think the public have rights which gas companies are bound to respect; but there is a limit to those rights. I do not think that the public is entitled to know the details of the affairs of the gas companies. I think that in our city the people know as much about the affairs of gas companies as the people of any city in the Union. I do not believe there is any place where the people know any more about the business of gas companies than they do with us. But I do not think that the public should be informed as to all the minor details of our business any more than they are informed, or ought to be informed, of the details of any manufacturing company's business. I think the great difficulty that gas companies labor under in regard to threatened opposition is due to themselves. I think those gas companies which are thus threatened have not, in a majority of cases, dealt fairly with the public. A company that has its capital stock watered from 40 to 50 per cent., and expects the public to pay a dividend of 10 or 12 per cent. on that watered stock, is not treating the consumer rightly, and I do not think that threatened opposition would hurt them, but would bring them to their senses. I know of some companies that occupy just such a position as that, where opposition was brought about for that very reason. I remember very well, a good many years ago being told by an officer of a gas company located in a city which it is not necessary to mention, that he had all the people in that town under his thumb, and (laying his thumb on the desk as he spoke) said, "I propose to keep them there." I replied to him, "Your thumb is very large, or the people very very small." The history of that place and that company has since shown that the man made a mistake. That is only one illustration of what I mean. I think if gas companies conducted their business as individuals do, fairly and equitably toward the public, there would be very little difficulty in the way of opposition and blackmailing, or anything of that kind. Hartford has not been free from attempts to blackmail the gas companies, but no one has succeeded. No one has ever received a penny of blackmail from the company I represent, directly or indirectly. Attempts have frequently been made to extort blackmail from us, but we have gone directly to the Legislature, and all the bills we have ever paid in this direction have been our lawyers' bills; and they have not been very heavy, because we have been able to go before the Legislature and stand upon our merits, and have not been afraid to answer any questions which the counsel of the opposition, or any member of the Legislature, asked in regard to our business. We have shown them that we conducted our business fairly and legitimately, and that our capital stock represents a bona fide investment; and at $2 per thousand feet we are enabled to pay a dividend on that capital stock which satisfies every stockholder in our company. Not one has expressed dissatisfaction, and we are enabled to do this because we have not an inflated capital. We are not afraid of opposition. I do not believe that the trouble is all with the municipalities. I think that the gas companies are to blame in many instances for the position which they hold to the municipality. I do not think the blame is all on one side. I think that the difficulty could, in a great measure, be overcome by the manager of the company. It would not be a bad idea, in my judgment, for the companies to take some little interest themselves in city affairs, so that they can have some voice in the matter of legislation. I found that worked very well in our experience. I have found that it has been of a great deal of benefit to have some one connected with our business as members of the Common Council. It worked so well in our company that I have come to the conclusion that it is a very good plan to have some of the stockholders members of the Common Council or Board of Aldermen. I think it has a healthful influence in the shaping of legislation. Certainly stockholders of the gas companies are competent to participate in the administration of city affairs. They are, as a rule, practical men, and are certainly as competent as stockholders of gas companies as those who are not stockholders, and they will not be likely to legislate to their own injury, to say the least. I do not believe in seeking for too much legislation. I think we have some companies that suffer from over-legislation. The less of that we have the better we are off, in my opinion. I, for one, do not fancy having a smelling committee to come around every little while, and investigate the quality of the gas, and fix the amount that I am to charge for it. I do not want to be interfered with in what I am doing, and I don't think anybody does. I think we should conduct our business in a practical, common-sense way, and so deal with the public that they shall be satisfied that we are not charging an exhorbitant price for our gas, and making large profits out of our business.

I do not think that we should withhold too much from the public, nor do I think we should submit our business to the inspection of the public in all its details. I think that we should preserve an attitude of honesty and fairness toward the public, and give them such information in regard to our business as shall satisfy them that we are working honestly and fairly. I think gas companies have not appreciated this position as they should, and that they have occupied the positions I have alluded to toward the public too much for their own good.

I think that the managers of gas companies ought to have influence enough with their board of directors (who are generally not intimately acquainted with the practical details of the manufacture of gas) to be able to fix a price that the public will be satisfied with. For if the consumption of gas is made popular, the consumption increases; and I think the way to bring that about is to establish a low price for the gas sold—as low as it can profitably be sold, in view of all the circumstances of the business; and I think that then the consumption will increase so that gas managers will be able to pay fair and reasonable dividends, and that the public will be satisfied with what the gas company is doing. I do not think the way to make the consumption of gas popular, and to bring about a proper relation between the gas companies and the public, is to charge a high price for poor management and interest and dividends on an inflated capital, or anything of that kind. I do not, therefore, think that this Association, or any association, can fix upon a rule of action that will reduce the capital stock of gas companies. The only way that that can be done is by those serving in companies that have an inflated capital, and know it, to satisfy their directors and stockholders that the time has come when they cannot expect large dividends on paper, or what they hold as paper, which does not represent anything that they put into the business. I think that is the great trouble with individual companies as a general thing, and is the very root of this evil of threatened opposition.

Mr. Nettleton—I would like to say a word on this subject. The paper, I think, was on the relation of municipalities to gas companies, but the discussion has wandered from that point to the real gist of the matter, I suppose—namely, self-preservation against competition—which is the real point of interest, so far as this dicussion and this question is concerned. Now, how shall a gas manager protect himself against competition? How shall he best do it? In my judgment, a gas manager has got to do that for himself. That, I think, is better than to rely upon legislation, better than to rely upon his directors, better than to rely upon any such influence. Then the question arrises, How shall he do it? The answer is, By qualifying himself to carry on his business, and by so carrying on his business as to be able to make gas cheaper and sell it cheaper than anybody who may come into his district and try to do it. That, in my view of the case, is self-preservation and self-protection, no matter what the capital stock of his company is. If he has a capital twice as large as it ought to be, he cannot pay but 4 or 5 per cent. on the nominal capital. But when the competing man comes in he says, "That manager understands himself; he can make gas as cheap or cheaper than I can, and there is no inducement for me to go there. I must go somewhere else, and find a man who is not so well qualified, and does not understand the business as well as he." With a perfect understanding of his business, I would also include the capacity to be on good terms with his consumers and the community, to be able to satisfy the community that he works for their interest, and gives them the best and cheapest gas he can; and to show them that there is no false representation in quality or quantity, so that if a committee of the legislature comes to investigate his operations, he can satisfy them that it is right. In my judgment, if the community believe in the integrity of the gas manager, and if he understands his business thoroughly, there is little danger to be apprehended from competition. Self-preservation lies in the hands of the gas manager himself. He must be able to do a little better for the same money, or for a little less money, than any other man. [Applause.]

Mr. Odiorne—I have had some experience lately which just bears out the correctness of some of the statements that have been made here. I am connected with a gas company at Exeter, New Hampshire. We have small works there, and until the present management took hold they had never paid any dividends and were always at war with the people. The present

management has made friends with everybody. The first quarrel we had with the municipality was in reference to the street mains; but we reconciled that so that the people were satisfied and the city authorities were satisfied. Everything seemed to harmonize well. The people of the place, and the public officers of the place, were on the most excellent terms with us - but after we had been running for a while I was called to Concord to defend the company against the attack of a set of blackmailers who came there to get a charter for an opposition gas company. We only sold two millions of feet, so you can judge what competition there would have been. We paid a four per cent. dividend on that by struggling and by economy. We have a little set of works, and the capital was watered by the proprietors who originally established the works. They were residents of this city. [Laughter.]

There is one point that I would like to bring up here incidentally, which I think most of the members of the Association must have noticed in their experience. Let a man be never so honest, and never so much respected, let him have the entire confidence of the people as a merchant or a business man, yet the moment he is appointed president of a gas company, they call him a scoundrel. [Laughter.] I have seen it myself and felt it myself. I speak from actual experience, and know whereof I speak. [Laughter.] As I was saying, I went to Concord for the purpose of defending our company against the efforts of an opposition company. I do not know what there was in my face that frightened them; but after I got there the opposition disappeared, and in less than twenty-four hours I had the unanimous report of the Senate Committee of our Legislature; and when I came to investigate the matter I found the opposition was started without any co-operation by the municipality, without any co-operation by the citizens, but that the clerk of our company was the head man of the opposite party. [Applause.]

Mr. McIlhenny—I do not know that I can throw any light upon this subject. It has already been pretty well ventilated. I agree entirely with Mr. Odiorne. It seems to me there never will be any compromise between the buyer and the maker of gas. I do not think that the price has anything to do with it. No matter how cheap you sell gas, or how good an article you make, the community will always suspect you of fraudulent transactions. As to opposition, in my judgment the prolific cause in this country is the cheapness of oil. These men come along and say they can make gas cheaper because they have a new process. We have all heard of the new process. There are millions of them; but the fact that oil is sold cheaply is a good reason for presenting this process to committees of legislative bodies that are ignorant of the subject. These men present elaborate drawings, and make exaggerated statements of the low price at which they can sell gas; and our legislators, supposing that they are honest, feel bound to accept these men as substitutes for the parties who are supplying the community. They say: "These men can sell gas at fifty cents a thousand, and the company that is now supplying the community are selling it for $2." So they think it is their duty to accept the oppposition parties. It is not their business, they think, to inquire into the permanency of these proposed companies the possibility of their being able to make reasonable profits, and they reason that if such opposition parties are willing to take the risk they are willing to have them do so. I have known of parties in the community in which I live to go to our Legislature, which is Congress, and offer to make gas for $1 a thousand, when the old company was selling gas at $2.25, and when the general price throughout the country was $2.50; and it was only by the greatest effort and influence and persuasion and exertion upon the part of the old company that the scheme was frustrated. In my judgment, no matter what the price of gas is—whether it is $2 or whether it is 50 cents a thousand—you will always be denounced as frauds. Even in Europe, where gas is sold very cheap, I do not think that the circumstances have changed. In one place I visited there on my trip they were selling gas for about 62 cents, and I asked the officer if there was any complaint. The day of my visit happened to be pay-day; he told me to sit down and listen for myself, and I heard precisely the same complaints that I have heard a thousand times here, of high bills and poor gas. And so, Mr. President, it will be, as long as you are selling an article without any definite cost, and as long as the consumer does not know what he is going to pay until the end of the month. He is paying for an unknown quantity. He forgets how he is burning gas, and when the bill comes he is disappointed; and as long as he is disappointed he is going to be discontented, and will grumble. The price, as I have said, has very little to do with it. I think the experience of everybody is that, no matter what the cost is, the complaint is about the same. I think that to some extent the dissatisfaction of the community might be overcome, or at least modified, if you could reach every individual consumer and show him that what you are doing is right and fair. If you could reach each consumer and explain to him about the cost of gas, and assure him and satisfy him that you are making only ten per cent. dividend, he would not think that that was too much, but still he would have that feeling of doubt in his mind all the while. He would say, "I cannot but think that what you tell me is true; I cannot help believing that you are not making exhorbitant profits out of your business and paying enormous dividends to your stockholders; but at the same time there is something about the whole business that is very mysterious. I do not see through it; I do not understand it." The trouble is, he does not want to understand it, for if he did understand it he would no longer have any cause of complaint. He wants to have some cause for grumbling. If he is satisfied that you are honest, and that you are doing the fair and honorable thing, there will no longer be any cause of complaint. Consumers want to have this doubt upon their minds, so that they can attack you at any time. They don't know what their bill is going to be, and they are always glad of some reason for attacking you.

Now, Mr. Harbison lives in a community where he can manipulate the town and control the Common Council. Of course, it is a great advantage to live in such a community as that, where the gas company is able to manipulate the Board of Aldermen and control their legislation; but I do not live in that sort of community. [Laughter.] Such a thing would be impossible in Washington. I use my best efforts to satisfy our people, and at the same time endeavor to meet the wants of the stockholders and sell gas as low as it is sold in other cities; but notwithstanding that the papers come out every week and say, "Why, gas can be made for 30 cents a thousand!" Somebody told them so, and the people believe it. It is perfectly natural for them to believe it, or at least to say that they believe it. They accept it as true because it is to their interest to so accept it. This matter is agitated just as much in London as it is in Washington, although gas is sold there very cheap. The companies have a great deal of trouble there in different ways.

Just as I came in I heard something in the paper read about inspection laws. I live in the only city in America, probably, where there is an inspection law, and it is perhaps the most rigid inspection law in the world. At first we were very much opposed to it, supposing it would be a great inconvenience and trouble to us; but we became used to it, so far as complying with it was concerned, and from our experience I believe that an inspection law has a tendency to compose and satisfy the community, because if you have complaints about the gas being poor, you can refer them to the inspector. But then a difficulty arises even there. The papers will say, "Where is the inspector? What is the matter with him? The gas is miserable!"—although the gas may be really in excess of the law in quality and purity. But if the newspapers happen to have a poor light in their offices the gas is blamed for a deficency in quality; and the people are in the same category, and will say the same thing. They will say, "This inspector is a perfect fraud; he is in league with the gas companies." Therefore I think that so far as endeavoring to satisfy the community is concerned, an inspection law amounts to nothing; but I think it is a very good thing for the gas companies, because it compels them to work to a certain standard and to sell a pure article. In that respect it is a good thing.

As I said in the beginning, I do not think there will ever be a compromise between the consumer and the seller of gas. In the first place, the people have no faith in the meter. They say that a meter can be manipulated, that it is never correct. And in the next place, as I said before, they never know how much their bill is going to be until they get it. The days may be dark, the weather may be bad, and they may burn more gas in their houses than they think they have. Every man that is circumspect in his expenditures is obliged to consider the amount of his coal bill and his butcher's bill, and regulate his domestic affairs accordingly. It is not so with the gas bill, and when the bill comes in at the end of the month and it is more than they supposed it would be they grumble. For that reason I say that I do not believe there will ever be a compromise. I admit the force of the argument that it is the duty of the gas companies to sell gas as low as they possibly can, but I do not believe that the gas companies are any more bound to exhibit to the public a detailed account of their expenses than are any other manufacturing corporations. No other kind of manufacturing business is called upon for an exhibit of the cost of production or of the amount of their profits, and I cannot see why gas companies should be made an exception to the rule; besides, if the gas companies did make an exhibit of their profits and expenditures to the public, they would not be satisfied. They will say that the cost and the expenditures are a great deal more than they ought to be, and that there is a much too large amount of extraordinary expenditures. Therefore I think that every gas manager will have to battle on individual grounds, and that they will have to do the best they can for themselves under the peculiar circumstances of each case. There seems to be no kind of device that can be universally adopted to establish satisfactory relations between the gas companies and the public, because the circumstances are different in nearly every place.

Now, so far as stopping legislation is concerned, it is utterly impossible. The parties who seek legislation are opposition companies. They have no interest in the community which they are trying to light with gas beyond getting all the money they can out of the people; and then, when failure or

exposure is imminent to get out of the way as soon as possible. It makes very little difference to them whether they say they will make gas for fifty cents a thousand. Their object is to get a charter, and by issuing bonds and stocks to make something out of it, and leave the poor, deluded stockholders to take care of themselves. I suppose that everybody here knows how that is done; but if there is any one so verdant at this late day as not to know, I will tell him how it is done. Tha opposition gas business has been a sort of credit mobilier. Four or five men join, and say, "we will go to a certain place and get a charter." For instance, I am one of the incorporators. We will get a charter, and we will elect directors out of the incorporators. Sometimes, that is put in the charter. You will contract with me for the works. We issue a large amount of stock, say a million of dollars. We sell it for, say, $400,000 or $500,000. The party with whom we contract to build the works puts them up at a cost of $150,000 or $200,000—the simple works; the $300,000 difference is then divided amongst the others, so that we may get, say, a clear $50,000 a-piece. We have erected the works, and the parties have subscribed for the stock. We then go to the old company and say, "here are these works; what are you going to do with them?" And the result is that the two companies generally compromise by dividing the city and town into two parts. Now, the original parties have left the concern, and have nothing to do with it. They have pocketed their surplus and have gone away and left the works in the hands of the people that subscribed for the stock, and these subscribers have got to do the best they can with them. That is about the way that opposition works are started. There is no possibility then of stopping them, because it is a principle of human nature that whenever you have goot a good thing all the rest of the world is trying to get it away from you. If you are making something somebody else wants to get some of it, and as long as that feeling exists you are not going to be free from opposition.

I think, Mr. President, that I have shown pretty conclusively that it does not make any difference whether you sell gas for fifty cents per thousand or two dollars per thousand. You cannot stop opposition in this way, and it cannot be stopped until it becomes so obnoxious to the community that they will stop it themselves. That was the case in London, and it will be the case in this country.

Mr. Harbison—Mr. McIlhenny has just stated that it makes no difference what the price of gas is in regard to threatened opposition. Parties who are at the present time making the most earnest efforts to get into our state in various places, have said to managers of gas in Connecticut that in any place where gas is sold as low as $2, it was of no use for them to try to do anything in such a place as that; but where they charge more for gas than $2 they considered that was the place for them to try to get into. This assertion was made by those who were trying to establish opposition companies in our State.

Mr. Coggshall—In the State of Massachusetts any number of gentlemen, with a certain amount of capital, two of them inhabitants of the town or city in which they propose to operate, for an opposition company, can form a company; but they must get the consent of the City Council or the Selectmen of the town before the can open the streets to lay pipes. I mention this to illustrate one of the statements that has been made here to-day in regard to making gas popular by selling it at a low price. I believe that the greatest enemy we have to contend with is the low price of oil. Now, I was in the city of Lowell a short time ago and they were selling gas at $1.80. I did not see but one store in the streets which I travelled that was lighted with oil. That shows to me that there was virtue in selling gas at a low price. [Applause].

The President—If Mr. Neal will take the Chair for a few moments, I would like to say a few words upon this subject. A great deal has been said upon both sides in regard to this question. There is a great deal of force in the views which Mr, McIlhenny has presented; but I think there is another view of it that is somewhat more favorable. I can readily believe that it is exceedingly difficult to satisfy the people of a large city like Washington, even if you deal fairly by them. But I think that the business can be conducted in such a way that you can satisfy the moral power of the community. The moral power of the community is exercised, not by the masses, but by the leading citizens. If you can satisfy the leading influences in the community—the manufacturers, the merchants, the bankers and the business men that you are doing what is right by the community, you have gone a long distance towards success. [Cries of hear! hear! and applause.]

When I first knew the company with which I am connected they were selling gas at $3. When I became connected with the company, about thirteen years ago, it was selling gas for $2.50. After a while, for a great variety of reasons which I need not now stop to state, we reduced the price to $2. At that time we lighted the city at $1.75, afterwards we lighted it at $1.50, and now we are lighting it at $1.25. When we came down to $2 it was a very common remark among the consumers—"Now we are entirely satisfied that you are doing the fair thing." And it produced a feeling of satisfaction throughout the community which exists to this day. And although, occasionally, a man will come and complain about his gas bill (some men will always complain, as we know, and would even if gas were sold at 50 cents a thousand), yet we pay no attention to that class of consumers, except to receive their money and give them a receipt, and go on selling them gas in the same way; but the best influences in society in our city are on our side, and are perfectly satisfied.

I think it is a great thing to have the moral support of the community in any business, and that it is especially so, in fact indispensable, in the gas business.

I read with as much interest as I never read a novel, the history of the test at Lowell some years ago. That is, in my judgment, one of the most instructive books that has ever been published in regard to the manufacture and sale of gas. Now, I think the very point in that case was this: That the gas company succeeded in proving to the aldermen, who represent the people and behind whom the people stand, that they could make ten per cent. and no more. The managers of the gas companies were called to the stand and made out their accounts and statements, and presented them for the inspection of the aldermen; and it was policy for them to do so. They succeeded in showing to the entire satisfaction of the people of that city, represented by their board of aldermen, that they could keep the gas at a certain standard, and sell it at such a price, and could simply make ten per cent. and no more, and, therefore, they had solid ground to stand upon. Almost everybody has sense enough to know that a gas company ought to make ten per cent. It is a risky business; it is liable to be destroyed by the introduction of other agencies. The business has already been very much injured by the introduction of petroleum, and almost every one is willing to concede that a gas company ought to make ten per cent. upon the investment. A millionaire in our town, who has not a dollar invested in gas stock, told me he thought a gas company ought to make 15 per cent.; he said—"I would not have gas stock unless it paid fifteen per cent." That was going a little further than I wished him to go, but he stated it voluntarily. As I said before, I do not think that any reasonable man can be found who will say that a gas company ought not to pay as much as ten per cent.

The history of the investigation of the gas company at Lowell proved to the board of aldermen of that town that the price at which that company was selling gas, and at the standard for purity and quality which they maintained, they could pay 10 per cent. and no more. It struck one on reading that book that it was the moral standing which they occupied that enabled them to come out so triumphantly from the investigation which was then carried out; and I think that what we want is to have the moral ground to stand upon which that company had, and to be supported by the better influences of socity.

Now, this matter of the establishment of opposition companies is one of those difficult questions to deal with which nobody will understand unless he looks at it in the light of personal experience. There has been a vast amount of this kind of work done, and Mr. McIlhenny has not told half the story.

Men have gone into communities and have constructed works which cost three times more than they ought to have cost, and they have issued stock or bonds, and have sold them and pocketed the money and have gone away and left the gas companies with a plant that was not worth the ground on which it stood—miserable, good-for-nothing works. There has been a great deal of mean work done in this way, whether done by Philadelphians or not I don't know.

Our friend, Mr. Odiorne, who was called a scoundrel, probably meant some of our Philadelphia friends when he alluded to Philadelphians.

Mr. Odiorne—I desire to say, Mr. President, that the Philadelphians who built those works are not now living.

Mr. Price—Such men come into a community and put up works that cost a great deal more than they ought, issue stock and bonds, pocket the proceeds, and go away and leave the worthless plant in the hands of the innocent stockholders. Now, what are those stockholders to do? They know nothing about the gas business. When people demand cheap gas in such a community the stockholders say, "Here is a plant that cost us so much, and in order to pay interest upon the money invested and a dividend upon our stock, we have got to charge a high price for gas." The reason why, in a great many places, gas, although sold at a low price, will not pay anything upon the stock, is because just such a swindle as that to which I have referred lies at the bottom of the whole thing. We have very loose laws all through the United States in regard to the issue of stock. Companies can water their stock almost as they please. I do not say they have done it, although there is no doubt that such has been the case in the history of some gas companies that might be named. We know railroad companies can water their stock, and that manufacturing corporations can water their stock, because there is no restraining influence. We had an exceedingly good law in Ohio in regard to that matter. A company could not increase its stock by watering it, because it was obliged to go through a rigid programme before

the company could issue its stock, and the directors had to swear that in issuing shares for increasing the capital stock not one dollar had been issued in the way of credit or in the way of watering it. In other words, they had to swear that the cash which the stock represented had actually been paid in. But that law has been tinkered and substantially done away with. Now, what we want, I think, is, where small or petty gas companies are thus situated, a good local enactment—something like that which they have in England—which would put the small companies upon a safe basis. If there was a law by which the matter might be examined into, and by which it might be decided how much capital such companies ought to have, and if they were permitted by law to make a certain per cent. on that capital, I I think it would have a tendency to remedy the difficulty to a great extent. think there might be an enactment by which these companies could stand justified before the community in charging a fair price for gas. As I said at the outset of my remarks, in my judgment the reason why the Lowell Gas Company vindicated itself so triumphantly was because it succeded in proving to the satisfaction of the community that its capital stock was bona fide capital, and represented value, and that all its transactions wera fair and legitimate with the public, and that it was not making enormous profits, and was not charging an exorbitant price for gas sold.

I wish to say a word to my friend Mr. Odiorne, in regard to being called a scoundrel. That is meant in a Pickwickian sense. ; After you have been appointed as president of a gas company, the people in the community in which you live know that you are just as honest as you were before; they will trust you just as implicitly; they will make you the executor of their estates, and will place as much confidence in you as they ever did, or as they will in any other man. I have had an opportunity to see how that works practically. We are authorized by law to charge 25 cents a month as rent for the meter when a party does not use 500 feet of gas monthly. If a party uses 6,000 feet of gas a year, he is not charged anything for rent for his meter. We have always been liberal, and if a party showed that he used 500 feet a month on an average, or 6,000 feet a year, we refund him any meter rent charged during the year. A man came into our office not long ago who had used about 5,500 feet, and he wanted to have the meter rent refunded. I happened to come in, and the secretary referred him to me. He said that he did not want to have to pay meter rent, because he had used that much gas, and he wanted me to have it refunded. I said to him that I did not see very well how we could do it. I told him it would break down the rule, and that if we did it in the case of one customer who used 5,500 feet we would have to do it in the case of another. And if we did it in the case of a man who used 5,500 feet, a man who used 5,200 feet might want the same thing, and the rule would be gone. He said, "I am charged more for having used about 5,500 feet than the man who uses 6,000 feet." "Very well," I said, "if you choose to use less than 6,000 feet and pay the meter rent, that is your own fault. You could have used 6,000 feet and had the meter rent refunded." The man said, "I don't call it honest to charge me more for using 5,500 feet than you do a man who uses 6,000." The man was a prominent citizen, and a member of the church, and I said to him, "Now, you are casting reflections upon directors who are members of your church." He said, "Oh, I don't mean the directors; I mean the corporation. I am talking about the corporation." You see, gentlemen, this man had not the slightest idea that the directors were not honest; but he was talking about that vague thing that has no soul—the "corporation." That is what people mean when they speak about the dishonesty of gas companies; and when my friend was called a scoundrel, those who called him so did not mean him personally, but the corporation. [Applause.]

I have found that there is great value in a properly executed inspection law. We had for y[illegible] in our State a law which authorized the appointment of an officer b[illegible] the Governor, with the consent of the Senate, who was called a "gas inspector." Every meter had to be sent to him to be inspected before it was put in, and he placed his mark upon it and certified that the meter was within three per cent. of being correct. The law allowed a latitude of three per cent. I found that the law was a very valuable one. In the first place, meter manufacturers were very careful to sell good meters. They knew that they were to be inspected by one whom they believed to be an honest man. In the next place, if there was any trouble about the meters you could always say, "My dear sir, that meter has been inspected by the State inspector, and his badge is upon it; there is every reason to believe that it is correct."

We had a further provision in the law: that if a party desired it, we would send the meter to be re-examined. If it turned out that it registered too much and ran too fast, we should pay the expenses; if it turned out that it ran too slow, the party should pay the expenses. If it was found to be right the party should pay the expenses. Although I have had frequent cases of complaints about the meter, I never found a man who was willing that the meter should be sent. They would say: "Oh, it is'nt worth while to take so much trouble. The meter has been inspected by a man who was undoubtedly honest, and understood what he was about." I do not know that a government officer is any more honest than anybody else; but the name and position often carry weight in the mind of a consumer. I have even offered to send the meter, and pay one-half of the expense ourselves; but those who made he complaint always said—"Oh, no; it is'nt worth while, I have no doubt it is all right." The truth is that if you have a standard to go by, and to refer your customers to, it is of great value, and I think if all our states had a good inspection law it would go a good way towards satisfying the community as well as being of practical advantage to the gas companies. But I think what we have to do is to seek, by every means in our power, to place our gas companies on a good moral footing, and to get the moral support and influence of the community, and make gas as cheap as we can and sell it as low as we can, and make a decent dividend. If we do that, I think the community will support us. If we do that, I do not think we shall have very much to fear from the establishment of opposition companies among us, or from the efforts of the blackmailers. I think the remedy for the difficulty may all be summed up by saying that we should aim to make good gas as cheaply as possible, and sell it as low as possible, and gain the moral support of the community—thus having a solid footing upon which to stand. [Applause.]

Mr. C. A. White—If there are no further remarks upon this paper, I move that the thanks of the Association be tendered to Mr. Sherman for his very able and excellent paper.

Adopted.

A paper by Mr. Spencer, on "The Future of the Gas Business," was then read by Major Dresser, as follows:

THE FUTURE OF THE GAS BUSINESS.

Order is said to be the first law of nature, and in all its operations whether in the growth and development of plants and animals, or in the organization of human society, nature's methods are always orderly.

Man, the latest and highest of created beings, endowed with reason and intelligence, seems to have been invested with the ability, and hence the duty, of exploring the vast domain of nature, of organizing, and to a certain extent controlling, its forces, and of developing its resources.

The progress of civilization and the advancement of scientfic investigation have pretty fully established the fact that in nature there is no loss; that matter, whatever its origin, to whatever conditions it may be subjected, and whatever changes it may undergo, in quantity it remains the same; that certain elementary substances are found to form its constituents, in whatever condition or under whatever circumstances.

This principle in nature, as unfolded in the progress of scientific inquiry, may be, and do doubt is, illustrative to some extent of a similar principle in the world's economy as applied to the great industrial enterprises that have from time to time engaged the attention and taxed the brain and muscle of mankind in the course of his history.

A very few illustrations, drawn from the comparatively recent history of the race, may be interesting and instructive, as showing that, notwithstanding great changes have been produced and great innovations have been made in the industrial economy of mankind, no great and important industry, having once obtained a firm footing, contributing beneficially to the uses, the comfort, and convenience of the public at large, employing a large amount of capital and labor, has ever been entirely superseded and its value lost to the world.

When in England, as far back as 1602, tramways were introduced for carrying coal from the mines, by the use of which it was shown conclusively that one horse could draw the load of two or more by the former method; and later, when Trevetheck, in 1804, using the inventions of Watt and others, by applying steam to what he termed a steam carriage; and later still, when in 1814, George Stephenson put to practical use the first locomotive, with the startling announcement that in his judgment the time would come when travel by this method would be accomplished safely at the rate of twelve or fifteen miles an hour, a great outcry was raised in opposition.

It was predicted that the innovation would practically abolish the use of horses; that the large amount of capital invested in horses and horse raising would be rendered valueless; and in addition, that the labor market would be greatly disturbed and depressed thereby. But instead, notwithstanding the immense progress in railroad building and operation since Stephenson's day, horses and men have continued to be in increased demand at greatly enhanced prices, and at more remunerative wages.

When in this country a great need was felt for the speedier transmission of the mails, and the administration of Martin Van Buren was trying to solve the problem by experimenting in some of the then Western States with an express mail at ten miles an hour, the indefatigable and persistent Morse was beseiging Congress for a small appropriation to establish a telegraph line between Washington and Baltimore. He was at first laughed at and denounced as an enthusiast and an impracticable theorist. But when he demonstrated its utility on a small scale, the note of alarm was again sounded. The destruction of our postal system, with its magnificent

appliances, was predicted; and worst of all, the hopes of the small army of place holders and place hunters would be buried with it in one common grave.

The telegraph came; its lines increased with wonderful rapidity, and, contrary to the expectations of the alarmists, while telegraph messages multiplied by the thousand, its effect was to stimulate and assist business enterprises in such measure that letters multiplied by the million; so that at present great railroad coaches groan under the enormous weight of the mails.

When, in the development of agriculture, machinery was about to be introduced, it was confidently predicted that should its use become general, the products of the farm would be rendered comparatively valuless. and the farmer and farm laborer would starve together. But with the development of new and improved machinery, and its application to plowing, sowing, reaping, threshing, etc., the products of the farm have steadily increased, their price advanced, and the farm laborer commands thrice as much wages as he did fifty years ago.

The sewing machine, when about to be introduced into our domestic economy, was expected to drive to starvation and desperation the sewing women of the country. But, notwithstanding its rapid strides in public favor, and its immense advantages, the demand for that kind of labor is greater than ever before.

Illustrations in great number in support of this principle might be adduced, but not wishing to tax your patience unduly, I forbear, contenting myself with one more, and that one from our own peculiar field of industry, with which you are all, no doubt, familiar.

When, in 1792, William Murdock, whose name and memory are cherished specially by every gas man, lighted his house and office in Cornwall, England, with coal gas, using gun barrels screwed together for conducting pipes, and in 1804 lighted the cotton mills at Salvord, and the lighting of great thoroughfares and great cities was hinted at, the tallow chandlers and oil producers protested, and were greatly alarmed for the integrity of their business. And in the face, and in spite of the enormous growth of the gas business, and the use of gas by all the civilized world at the present day, the tallow-dip still maintains its importance as one of the many kinds of lights used in some measure everywhere.

There is, however, another and entirely different aspect of this subject which it might be useful to consider. All threatened innovations have not by any means been successes. On the contrary many, very many, inventions and contrivances have been pressed upon the world's attention with great persistency, for which important claims have been put forth, and great promises made, which, upon fair trial, have proved magnificent failures.

The "Ericsson Hot Air Engine," which was to entirely supersede steam, was of this class.

The "water gas" abortion which, with such a flourish of trumpets, such unreasonable pretension, produced so much excitement, in Philadelphia *notably*, some twenty years ago, and its results, is another illustration.

Nor is the present the only time that electricity, which has been of such incalculable benefit to mankind in its proper sphere (of which more hereafter), has attempted to invade the domain, and usurp the place, of other and less pretentious elements.

Some ten years ago the writer, being in New York, was startled at the recital, by a very intelligent gentleman—an intimate personal friend—of an account of a wonderful machine invented by one Paine, operated by electricity, capable of being made of any size and power required, of universal application, and operated at a cost of from one-tenth to one-twentieth of that of steam—indeed, the cost was merely nominal.

A small and select number of capitalists, my friend among the number, had already become so fully satisfied of its practicability—and this by witnessing time and again the operation of what the inventor called a "two-horse power" machine—that a company had been formed in New York with a million of dollars capital, a full corps of officers, and a luxuriantly furnished office on Broadway.

Everything was in prime working order, and the favored few stockholders were anxiously waiting and dreaming of untold millions.

Through the influence of my friend I was permitted, with a select company of scientific gentlemen, to visit Mr. "P's" workshop, which was in a dilapidated building in an obscure quarter of Newark, N. J., and thus see for myself the operations of this wonderful invention which was so shortly to revolutionize the industrial economy of the world, and to hear the shrewd explanations of the inventor in reply to questions of the electricians present.

I need not tell you that I was surprised. I stood transfixed with amazement while I saw this little machine—which two men could have carried easily—running a circular saw through a two-inch plank with ease, and operated *ostensibly* and *apparently* by a battery of about four small cups, and, as the inventor claimed, at a cost not to exceed ten cents per day.

My friend promised to keep me posted, and I returned to my Western home. I heard nothing more; and, being in New York again in a year or two, I inquired for this wonderful prodigy, but the place that had known it and its author knew them no more. Nothing was left but an apology. No invention of modern times promised more; none have yielded less.

Other and similar cases in great number might be enumerated, did time, and your patience, permit; but I leave the remembrance of your experience and observation to supply them.

I come now to the question—"What is to be the future of the gas business?" I think I have shown on general principles (though imperfectly) from the history of this and other industries, that a business once firmly established as the gas business is, and one that has served the uses of mankink in so marked a degree, contributing so largely to facilities for business and pleasure, is in no immediate danger of being superseded.

And, also, that every new and really valuable discovery, made and developed so as to command the recognition and confidence of mankind, will be an addition to the general stock, but will not supplant others equally valuable and necessary to the world's comfort and happiness.

In view of the foregoing I am led to the conclusion that the electric light, which so recently, both in this country and in Europe, produced such commotion among the holders of gas stock, need give us little alarm. And although I am persuaded that few intelligent men, actually engaged in the practical business of making gas, were at any time seriously disturbed, it must be admitted that there was with us all a little feeling of uneasiness not comfortable or desirable to experience.

I presume every intelligent man is prepared to admit the possibility of electricity occupying in the future a certain place, of limited extent, in the general field of artificial illumination unless, after a fuller investigation of its claims, it is found to be out of its sphere in this field.

The experiments of Sugg and others, now being so vigorously pushed, tending to show the superiority of gas under all conditions, even where the most intense light, concentrated at one point, is desired, will probably lead to its abandonment altogether.

I think the intelligent public even have already about arrived at the conclusion that it can never be successfully applied generally.

An industry that could not only hold its own, but attract to its use millions of capital, in the face of a flood of illuminants issuing often spontaneously from the earth; and—with the improved facilities for its use—producing so good a light as petroleum, I argue need not fear the electric or any other light, and the agitation should only stimulate to greater effort in the improvement of our methods, and greater diligence in the development of our proper business.

And, by this means, we may be enabled, in a quiet and modest way—the way of all gas men—to give notice "to whom it may concern," that we, as prior occupants of this field, not only do not intend to yield our proud position but that we are worthy to hold it against all newcomers, from whatever quarter or of whatever kind.

To do this we must pay strict attention to all the details of our business, make more gas and better gas out of our materials; *stop the leaks* in the retort-house, in the purifying house, in our street mains, in our offices.

By the strictest integrity in the conduct of our business disarm captious criticism, whether arising from ignorance, or prejudice, or both; and in a more marked degree in the future than in the past furnish to our patrons a better, safer, and, all things considered, a cheaper light than can be had elsewhere.

To the younger members I would say, qualify yourselves for thorough work, not only practically, as most of us have in some good degree, but scientifically as some of us have not had opportunity to do. Study to make your already important industry a still greater necessity to society in all its departments; to develop new uses, such as cooking, heating, propelling machinery, and such others as your observation and experience may suggest, never for once losing sight of the fact that the world moves, and those only will hold their position who move with it.

And as we all honor the memories of the eminent, enterprising, and worthy men who laid the foundations, upon which we have, to the best of our ability, assisted in rearing the noble superstructure to its present height, may those who follow us when, with superior intelligence and improved facilities, they are called upon to put the finishing touches on the grand old edifice, not disdain to own that we, too, in our day, assisted, in no unworthy degree in the great achievement.

Mr. Helme—In regard to the future of our bnsiness, I for one feel that it is very encouraging in several directions, more especially in one that I will name. I think that if it is adopted by gas companies, we will all find a great increase in the consumption of gas. I had occasion the other day to go into a place on Chestnut street where they were making gas engines, and I was surprised to see the extent to which that industry has been developed. I had visited the place in the month of February or March, and they were then doing but very little. When I went in the other day I found their shop filled with machines. They had leased the adjacent building,

and they told me that orders were crowding on them beyond their ability to supply. All this change seems to have taken place within the last two or three months. It certainly looks very encouraging for the future of our business. These engines are a success. I do not know whether the gentleman connected with that establishment is here or not; but I have no doubt he would be very glad to show you what they have there. There are several of them in operation. In a surgical institute in this city one is run from 7 o'clock in the morning until 6 o'clock at night. I went there and looked at it. They never go near it from the time they start it in the morning until they stop it at 12 o'clock, dinner time. After the dinner hour a boy goes down and starts it, and no one goes near it until 6 o'clock, when it is stopped. They have no trouble with it whatever. I sent one down to Atlanta, Ga., and it was put in a printing office there, and the gentleman who purchased it has written me a very handsome letter in regard to its efficiency. Altogether, I feel that it is going to be the source of a large increase in our business. Taking all these things into consideration, I, for one, feel very much encouraged, notwithstanding the electric light, and notwithstanding petroleum.

A Member—I have understood that gas engines are used in Philadelphia for elevators, and I would like to inquire of Mr. Helme if he knows where one could be seen in operation in that way.

Mr. Helme—I am not prepared to say that they are used for elevators. I think there are some used for elevators in warehouses, but I do not believe they have adopted them in the hotels yet. I cannot even say positively that there are any in use for elevators in warehouses. I regret to say that they have not yet contrived to use them for exhausting purposes, for the simple reason that a gas engine has to run at a uniform rate of speed. Now, a steam engine, of course, is capable of being run at different degrees of speed, and that is absolutely necessary in working an exhauster. We all know that when we want to diminish the vacuum, we have to reduce the speed; and when we want to increase the vacuum, we have to increase the speed of the engine. We cannot do that with a gas engine, because they have to be run at one uniform rate of speed—180 revolutions per minute, I believe it is. They fall to 179 revolutions and to 181; but 180 is what it is meant to be. Therefore they cannot as yet be successfully used for running exhausters in gas works in this country. But the manufacturers say that there is one in use abroad for that purpose. I can make inquiries as to whether these engines are used for elevators in this city, and will probably be able to give the desired information in the morning. There is one in a jewelry store near by, but it is in the basement, and is not always in use; besides, it would be necessary to pass through the store, and it might be troublesome in getting at it. But this one that I spoke of in use at the surgical institute can be seen at any time.

Mr. Munzinger—I do not see how it is possible to run gas engines for elevators, because the engines have to be stopped and started. In a warehouse where they can shift the belt, it might be very well adapted to that purpose; but as the engine is at present constructed, I do not see how it could be used for elevators in hotels. Perhaps this difficulty, however, may very soon be remedied.

Mr. Helme—It cannot be run for elevator purposes where they have to stop and start the engine, that is, every time. But there are many mechanical contrivances which might be adopted, where the elevator belt can be so adjusted that the engine can be used for that purpose. Some contrivance of that kind, it is possible, may easily be adopted, so that the difficulty may not be a serious one.

Mr. C. H. Nettleton—This subject of gas engines is one in which I take a great deal of interest. I really think more of it to-day than I do of the gas stove business, because I believe we can make more money out of it. I have supplied two engines to manufacturers, one an engine of 7-horse power and one of 4-horse power. The 4-horse power engine has run over a year, and the 7-horse power engine has run a little over a year. I have just sold another 4-horse power engine. The 4-horse power engine has been run intermittently for printing presses and for making paper boxes. It has used a trifle over 50,000 feet during the time it has been in use. The other one has been running sewing machines for making corsets. It is placed in a four story building. That has used on an average 20,000 feet per month. It has gone as low as 18,000 feet and as high as 22,000 feet, but the average has been about 20,000. With gas at $2 per thousand, the parties who use the engines are exceedingly well satisfied. With one engine there has been absolutely no trouble at all. It is used by a concern who know how to take care of an engine, and it has given them no trouble. The other one is used by a concern that do not know much about handling engines. They are men from the ordinary walks of life! Until within a few years, I believe, they were butchers, so that they knew nothing about machines, and they had some little trouble; but they now say they have little or none. All the labor that is spent upon this engine (the 7-horse power one) is the time required to start it in the morning, which takes about five minutes. It runs until noon. At one o'clock it is started again, and it runs until night. Every Saturday the sliding valve is taken out and cleaned, and about once in four weeks the piston is taken out and the gummy substance cleaned off. The labor amounts to almost nothing at all. The people who sell these engines are Messrs. Schleicher, Shumm & Co. They are young German people, and I like them exceedingly. I have found their statement to agree exactly with the results as nearly as I can get at them. They say that is about the averrge horse power of the engines sold in England, and that out of 21½ feet per hour you can lift 33,000 lbs. one foot high in a minute. We have found that it requires about 33 or 35 feet per hour; but the parties who use the engines are satisfied. The gentlemen who uses the 7-horse power engine uses a large amount of gas; but he told me that although he is using so much gas, it costs about the same with labor added; but, said he—"I am afraid of a steam boiler. There is danger of the water getting low, and the boiler exploding, and the property being destroyed; with this engine there is absolutely no danger."

I suppose it is true that there is no possible danger in using these machines. I believe that there is a great future for them. I believe that in manufacturing operations, where there is less than 10-horse power required, they can be introduced and used profitably with gas at $2 a thousand, and that you can get almost any price for them after they are introduced, because they are so exceedingly handy. I am going to see the people who manufacture them to-morrow morning on business, and I would be very glad to have any gentlemen accompany me who wishes to see them. I think he will be repaid for his visit. [Applause].

Mr. Neal—I would State that in the office of the Boston Gas Light Company there is a gas engine running almost constantly, furnishing power for a printing press, on which all the bills that are used by the company are printed. It works very satisfactorily.

The Secretary—I would like to ask on what floor the seven-horse power engine is used.

Mr. C. H. Nettleton—It is the second floor from the street. The engine is about fifteen feet above the street, and the street is perhaps twenty feet above the gas works. The other engine is at the extreme end of my piping, but we have no trouble. I believe the engine can be supplied on .5 pressure. I generally keep the pressure at about ten-tenths. I have no complaints on account of low pressure. There is no difficulty whatever in supplying the engine with gas at low pressure.

The Secretary—Is there any jar to the engine?

Mr. C. H. Nettleton—There is more or less jar on the floor on which the engine is placed. One of the engines is on the second floor in a small wooden building poorly constructed, and when an explosion takes place you can see the floor shake; but there has been no damage, and this engine has been running for a year.

The President—What are the sizes of the engines they make?

Mr. C. H. Nettleton—In this country they make engines of seven-horse power. They calculate to make them twelve-horse power, I believe. In England they have one of thirty, and in Germany one of fifty; and they make intermediate sizes. The smallest size is two-horse power. As I said last year, the great trouble with these engines is the price. I have worked with these men, and tried to get them to reduce the price. They are very frank, and say they cannot afford to. They say that they are obliged by their contract with the patentee to pay 10 per cent.; and that they sell the engines in this country at a lower price than they are sold in England. I know that to be the fact. Besides that, the price of labor and of iron is higher here than there, and we cannot reasonably expect them to come down in their price. I get around that by allowing on a four-horse power engine $100 worth of gas free, and on a seven-horse power engine $150 worth of gas free. To parties who put in these engine I allow this amount of gas as a bonus, which reduces the price of the engine very much. I allow the seven-horse power engine $150 worth of gas free, and in less than a year I have sold over $400 worth or gas for it, which I consider a very good investment.

Mr. Helme—In regard to the price of these engines, I will say that I have examined very carefully the work that is done upon them. I have been a machinist myself, and think I am able to judge of the merits of work of this class. There is a great deal of work upon them, and it is necessarily very fine work. Every part of the machinery fits with the most perfect accuracy. The class of work is very fine and beautiful, and very expensive. No better or finer work is ever turned out than they put on these engines, and, as we all know, good work cannot be done as cheaply as poor, slip-shod work. I do not think that the price of the engine is at all high when we come to examine the amount and character of the work that is put upon them.

Mr. Wood (Syracuse) I would like to inquire of Mr. Helme how the price of the gas engines compares with the price of a steam engine and boiler of the same or larger capacity?

Mr. Helme—If you have to buy a Baxter engine and boiler you will not get the same power for the same money. If you go to Providence and buy

a Corliss engine of the same power, with a boiler, the whole thing will cost as much money as the gas engine does, and will not do its work any better,

Mr. Harbison—I move that the thanks of the Association be tendered to Mr. Spencer for his very instructive and encouraging paper upon the future of the gas business.

Carried.

Mr. Neal—I am told by the Secretary that there is not sufficient time left to read and take into consideration another paper this evening. As it is quite warm, and the members, I think, are somewhat wearied, I would make the motion that we adjourn until 10 o'clock to-morrow morning. It is not yet six o'clock, the time fixed by the Executive Committee as the hour for adjournment, but I presume, for the reasons I have stated, the members will not be disinclined, in the absence of any important business, to adjourn at this time.

Carried.

The President—I beg to ask, on behalf of the Association, that every member will be promptly on hand in the morning at 10 o'clock. I hope that those who have outside business to attend to will not unnecessarily delay it and come in late, and thus interfere with the reading and discussion of the papers. It is rather discouraging to be obliged to urge members to talk upon the interesting questions which some paper that has been read may have raised, and then to have the discussion interrupted by members coming in late while it is going on.

Mr. Harbison—A year ago, when it was proposed that the Association should meet in Philadelphia, there was an impression went out, I do not know from what source, but it was quite general, that Philadelphia, being considered the head-quarters for manufacturing articles connected with our business, there might be, during the meeting, many things brought together for exhibition, in the shape of apparatus, burners, etc., which would do away with the necessity of running to this place and that all over the city. I would like to inquire whether anything has been done toward carrying out that suggestion.

Mr. Cartwright—In reply to the inquiry of Mr. Harbison, as one of the local committee of arrangements I would respectfully report that one part of our programme was to carry out, if possible, some such arrangement as that spoken of by Mr. Harbison. Applications by circular were made by the committee pretty generally, to the manufacturers of gas apparatus around the neighborhood of Phildelphia. We received but one or two responses, and they came from outside the city. The manufacturers of apparatus in Philadelphia took the view that it was easier for the members to visit their establishments than to have the various articles brought into one place for exhibition, and that each article could not be sent to such a place without interruption to their business; consequently there was no response made, and the committee had to give it up. I think it was about the 15th of August when the matter was dropped. Another thing in connection with the matter was that it would have necessitated hiring a room at a distance, or at least separate from this building, which was a serious objection. It would have brought together a great deal of matter, and have taken a great deal of time, and would have distracted the attention of the members from the business of the meeting. Nothing, therefore, has been done in that direction, except that Mr. Morris, who is a member of the Franklin Institute, brought some of his apparatus here, and will explain it, if necessary. Further than that, however, the committee were unable to get anything together, although we made an effort to do so.

The President—I had hoped that there would be exhibited some of the new lanterns or burners that we have heard of. The cut of Sugg's lantern burner has been published in the London *Journal* and, perhaps, in the American Gas Light Journal, although I do not remember to have seen it.

I was anxious to know, in reading a description of that burner, how it could be supplied with oxygen or air, and, at the same time, avoid gusts of wind. From the published description I could get no idea how the supply of air could be introduced, and, at the same time, avoid the flickering or blowing of the flame by the wind. For that reason I was quite anxious to see the operation of this burner, and had hoped that there might be one on exhibition at this meeting.

Mr. Helme—The Wigham burner or lantern is perfectly airtight. The air is all admitted at the top of the lantern, and turns around under the lower edge of the chimney, between the flame and the bottom of the chimney, impinging on the flame as it makes the turn.

The President—It is very desirable, I think, to introduce these burners into this country for lighting large spaces, parks, squares, halls, etc., and I should like to know the appliances by which they can be made to operate properly.

Mr. Helme—I wish the gentlemen of the Association would go and look at this burner on Cherry street that I have spoken of. We have just got it, and it is almost as much of a stranger to us as it is to the gentlemen here. They claim that it is a 51 feet burner; but we have not yet been able to pass more than 35 feet. They say it is 429 candles; but as we have made no photometric tests we are not able to state its candle power from our own experiments.

Mr. Harbison—At the Municipal works in New York there is one of these Sugg lanterns in use. It is in their office, and can be seen by any gentleman who goes there.

A single point further. We voted to-day to amend the Constitution by striking out the City of New York as the place to hold the next annual meeting. I would suggest that a committee be appointed to consider the question of location for our next annual meeting, so that the matter will not have to be decided in a hurry.

Mr. Helme—I move that the matter be referred to the Executive Committee, and that they be instructed to consider and report.

Carried.

The Association then adjourned until the following morning to meet at 10 o'clock.

[To be Continued.]

How to Dispose of Town Sewage to the best Advantage.

"How to dispose of the town sewage to the best advantage" is an important and momentous question. So many diversified opinions exist on this subject, and every system in use is more or less grumbled at; therefore the solution of the problem is by no means easy. This subject has occupied the attention of the Trowbridge Local Board for some time. They wished to treat the sewage with chemicals, but the Local Government Board preferred a sewage farm, until one of their members, Mr. Clark, being in London, took the uncommon course of waiting upon the President of the Local Government Board, Mr. Sclater Booth, and personally explained the circumstances of the case, The members of the Trowbridge Local Board consider the results of the interview to be highly satisfactory. After a good deal of discussion upon two or three different schemes, and suggestions of modifications, etc., the Local Board have decided upon one that they consider in every way satisfactory, and this has been forwarded to the Local Government Board for their inspection. The following is a description of the scheme:

The buildings are to be erected and tanks formed upon two acres of ground purchased by Mr. Ludlow, adjoining the present outfall. The gangings to ascertain the exact flow from the outfall have been delayed on account of the floods, and the engineers, Messrs. Gotto and Beaseley, and Mr. A. W. Estridge, have been unable to arrive at any definite results. To be on the safe side, they have assumed that one 20-horse power engine and boiler, with centrifugal pump of proportionate size, will be sufficient for raising the sewage and mixing the chemicals. The system intended to be used is the lime, sulphate of alumina, and carbon process. Three covered tanks are provided, two of which will be in use, while the other is being cleared of deposit. The effluent water will be strained off by a floating apparatus of a simple and effective description at the end of each tank, and passed through filters before being discharged into the river. The buildings and tanks are all above flood level. Flues from the boiler pass under each tank for the purpose of drying the deposit, the removal of which will be effected easily and speedily by means of a truck running on a tram at the bottom of the tanks, and passing through a penstock door at one end. This will avoid the necessity of raising the deposit by means of a crane or any similar contrivance. Accommodation is provided for duplicate engines and boilers, as the board might at some time find such to be necessary. The estimated cost, including the expense of making a new approach road from Bradford Road, is £6,250. To cover this and incidental expenses, the engineers recommend the Board to apply for a loan of £7,000.—*Gas Trade Circular and Review.*

The Electric Light in Burmah.—The *Times*, of India, says:—"An extensive business transaction has just been concluded between the Indian Electric Light Company and the King of Burmah. Attracted by the experments which have been made in England with the electric light, King Theebaw sent an agent over to Calcutta to purchase the largest portion of the company's machines and plant in Calcutta and Bombay, including the apparatus for forty lights, with engines by Ransomes, Sims, and Head, that was lately employed in lighting the Hooghly Bridge. The Burmese agent paid down 80,000rs. in hard cash, and we are informed that the entire cost of the lights—forty of Jablochkoff's and eight of the regulator system—and fixing them in the royal palace and gardens at Makdalay, will be not less than 100,000rs. Evidently the treasury of his Majesty is in a healthy condition.

The Gas Engine in the *Review* office has now been in operation a whole year, and in that time has consumed 32,300 feet of gas, which makes our bill $96.90 for motive power. The preceding year it cost $225 for steam. Count us among the converts to the new motor theory for small power.—*Elkhart, (Ind.) Review.*

THE AMERICAN GAS LIGHT JOURNAL AND CHEMICAL REPERTORY

A. M. CALLENDER & CO.,
PROPRIETORS.

Editor—G. WARREN DRESSER.

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MONDAY, NOVEMBER 17, 1879.

Official Report of Examinations of Gas for two Weeks ending Nov. 8, 1879, made at the Photometrical Room of the Department of Public Works.

Corrected Illuminating Power.

Oct 1879.	Time of Day at which Test were made.	New York Gas-Light Co.	Manhattan Gas-Light Co.	Mutual Gas-Light Co.	Metropolitan Gas-Light Co.	Harlem Gas-Light Co.	Municipal Gas-Light Co.
27	Between 9.30 A.M. and 1 P. M.	16.26	16.93	19.77	16.44	15.92	
28		16.49	16.79	19.81	16.78	15.76	
29		16.64	17.51	20.56	17.02	16.40	
30		16.78	16.78	20.16	17.58	16.43	
31		16.70	17.16	20.27	17.47	16.54	
Nov. 1		16.54	16.66	18.93	17.99	16.86	
	Average	16.57	16.97	19.91	17.21	16.32	
3		17.00	17.48	20.30	17.73	16.58	
5		17.01	17.10	19.50	17.27	16.64	
6		16.38	17.00	18.74	16.75	16.54	
7		16.25	16.78	18.35	16.59	16.66	
8		16.68	16.70	18.20	16.66	16.48	
	Average	16.66	17.01	19.01	17.00	16.58	

Sugg-Letheby burner.
E. G. LOVE, Gas Examiner.

Gas-Lighted Buoys.—The Trinity Board have recently given public notice that it is their intention shortly to place experimentally two buoys lighted by gas at the entrance to the river Thames—one near the Mouse Light vessel and the other near the Sheerness middle buoy.

Correspondence

[We are not responsible for the opinions expressed by Correspondents. Correspondents, in all cases, should sign their communications with their names and address in full—not for publiction, unless desired, but as a guarantee of good faith.—ED.]

ADRIAN, MICH., Nov. 4, 1879.

Mr. Editor :—About three years ago I had quite a quantity of coke on hand, which to me was getting to be an eyesore, so I procured a crusher, and went to selling crushed coke. The coke went good, but the crusher went slow. We had fifty cents more for crushed coke than lump, and a ready market. I improved my crusher to go by power, and reduced the cost of crushing, which had been about all I got extra. My new machine would crush about 100 bushels per hour; and that was getting to be slow work, too, with a good deal of wear and tear on the machine, so that, as the maket demanded all our coke and crushed, I thought perhaps I had better be about looking up another machine. So I made another, which has, to tell the truth, astonished myself and others who have seen it work. It occupies a space about 3 feet square, can be run by hand or power, regulated in a moment to any size, crushes with a very small percentage of waste, and with a 4-horse engine will crush 15 tons or 750 bushels per hour, and can do it all day. I think it a pretty good thing, though I may be mistaken, and don't know what is going on in the world, as I am stopping away out here on the edge of civilization; but I am going to Chicago next fall to find out a thing or two, and was a good deal disappointed that I could not get to Philadelphia last week.

Your JOURNAL has been of great value to me, and I hope to have more time some day to write out some of my experiences and experiments for the benefit of the fraternity.

Yours truly,
C. H. RAYNOR.

Explosion at the New Bedford (Mass.) Gas Works.

About 7 o'clock on the evening of November 2, the two north sections of the hydraulic main over the house in which the gas is manufactured exploded, tearing out about twelve feet. The main is about two feet in diameter, and made of three quarter inch cast iron. Work was at once commenced to repair damagers, but the break happening at the north end, where the gas passes through into the pump room, no more gas can be manufactured until the sections are replaced, and the city will be in darkness to-night, but will probably be lighted to-morrow night. At the time of the break there was some 70,000 feet of gas in the gasometer, which was all consumed last night, lasting until 4 o'clock this morking. The gas for the city's use is manufactured each day, and yesterday being Sunday, none was made. Had the explosion occurred any week day, the supply would not have lasted as long as it did. The hydraulic main is the only piece of apparatus about the works of which duplicate parts are not kept. The main, however, extends to the south, beyond the retorts, with the view of putting in additional retorts if they should ever be needed; and for the present this part of the main will be taken off and inserted in place of the section which was destroyed.

It is not known how the accident occurred, but it probably was caused by air getting mixed with the gas.

The only supply of manufactured gas at the time of the accident was in the large gasometer. The small ones are out of repair, and unfit for use. A great deal of surprise is expressed by people generally that the gas company should have but one night's supply of gas on hand. It would be a good idea to have the old gasometer repaired and kept full as a reserve supply.

The company has sent postal cards to consumers notifying them of the condition of the works and the prospect of repairs.

Repairs on the hydraulic main at the gas works were completed about 4 o'clock, yesterday afternoon, and the manufacture of gas immediately commenced. At 7:20 in the evening the gas was turned on, enough having been secured to light the stores, halls, and many of the residences, and from that hour the supply gradually increased until a full supply had been obtained.

The company feels very thankful to its patrons for the general expression of sympathy manifested toward it in the strait in which it was placed, and will take precautions that no such exigency shall arise in the future.—*New Bedford Standard, Nov.* 4.

REDUCTION IN THE PRICE OF GAS IN THE CITY OF NEWARK, N. J.—The price of gas has been reduced in the city of Newark to $2.40 per thousand cubic feet to small consumers, and to $2 25 and $2.00 per thousand cubic feet to large consumers.

The city is charged for the gas consumed in the public lamps, of which there are about three thousand, somewhat under $3?00 per thousand cubic feet, in accordance with an exclusive contract for the term of ten years made two years ago.

Prices to private consumers in Trenton, Camden, Elizabeth and Paterson are the same.

Fatal Explosion at the Ionia Jail.—IONIA, MICH., Oct. 23.—A terrible and fatal accident occurred at the State house of correction, near this city, last night. One of the tanks designed to hold gasoline, which is made into gas for lighting the prison, exploded with terrific force, burning Charles Crystal so severely that he died this morning, and seriously injuring engineer Essec. Crystal was a prisoner sentenced from Oakland county. Essec's burns make his case a critical one.

Reduction in Price of Gas in Wilkes-Barre, Pa.—The Wilkes-Barre Gas Light Company has reduced the price of gas to $2.50 per thousand, with a discount of 10 per cent. on bills under $20, 15 per cent. over $20, and 20 per cent. over $50.

Prices of Gas Coal.

Penn and Westmoreland.	$4.50 at New York.
" "	3.10 at Baltimore.
" "	3.75 at Philadelphia.
Despard.....	4.25 at New York.
Newburgh Orrel.....	3,50 at Baltimore.
Fairmont.....	
Chesapeake & Ohio.....	4.50 at New York.
" "	
Newcastle	3.25 to 3.50
Provincial	3.50 to 3.75
Cannelton Cannel (by cargo).....	8.75 at New York.
Ince Hall.....	7.25

The above prices are about $1 per ton below those of 1878.

Gas Stocks.

Quotations by G. W. Close Jr., Broker and Dealer in Gas Stocks.
(with W. B Scott & Co.,)
24 PINE STREET, NEW YORK CITY.
NOVEMBER 17, 1879.

☞ All communciations will receive particular attention
☞ The following quotations are based on the par value of $100 per share.

Gas Co.'s of N. Y. City.

	Capital.	*Par.*	*Bid.*	*Asked.*
Central.....	466,000	50	50	—
Harlem.....	1,800,000	50	40	45
" Bonds	170,000			103
Manhattan.....	4,000,000	50	145	150
Metropolitan.....	2,500,000	100	117	121
" Scrip...	$1,000,000	...	100	103
Mutual.....	5,000,000	100	58	—
" Bonds, gold.	900,000	1000	100	105
Municipal.....	1,500,000	100	140	—
" Bonds.....	750,000		105	110
New York.....	4,000,000	100	80	87
Northern.....	270,000	50	—	100

Gas Co's of Brooklyn.				
Brooklyn	2,000,000	25	130	140
Citizens	1,200,000	20	70	75
" S. F. Bonds.	320,000	1000	100	102
Peoples	1,000,000	10	30	35
" Bonds.	325,000	...	--	95
" Scrip	300,000	...	75	80
Metropolitan	1,000,000	100	85	95
Nassau	1,000,000	25	70	75
" Ctfs.	700,000	1000	80	85
Williamsburgh	1,000,000	50	75	80
" Scrip		...	98	100
Kings Co	135,000	100	—	50
" Bonds	40,000	—	—	—
Union Co. E. N. Y.		25	—	50
Richmond Co., S. I.	300,000	...	60	85
Out of Town Gas Companies.				
Bath, Maine	70,000	100		
Buffalo Mutual, N.Y	750,000	100	65	70
" Bonds	200,000	1000	95	100
Baltimore, Md.	2,000,000	100	95	98
" Ctfs., gold	1,000,000		95	10
Bayonne, N. J.		100		90
Brockport, N. Y.	25,000	100	...	80
Citizens, Newark	918,000	50	100	103
" " Bds.	124,000	—	105	10
Chicago Gas Co., Ills			132	—
Cincinnati G. & C. Co.				190
Derby of Conn	160,000	100	60	80
East Boston, Mass		25	114	120
Elizabethtown, N. J.	300,000	20	—	130
Fort Wayne, Ind.		100	...	—
Hannibal, Mo.	100,000	100	95	100
Hartford, Conn	700,000	25	120	125
Hempstead, L. I.	25,000	100	...	—
Halifax N. S.	400,000	40	148	150
Hamilton, Ontario	150,000	40	117½	
Jersey City	750,000	20	140	145
Jamaica, L. I.	25,000	100	...	—
Jacksonville, Ill.	120,000	50	100	...
Lewistown Maine	400,000	100	70	80
Lima, Ohio,	60,000	100	—	...
Bonds	30,000		90	
Laclede St Louis Mo.	1,200,000	100	—	75
Long Branch		20	30	40
New Haven, Conn		25	152	—
Peoples, Jersey City		...	40	50
" " Bds.				95
Peoples of Albany	650,000	100	—	10
" Bonds	350,000	1000	--	--
Peoples of Baltimore		25	44	48
" Bonds			106	—
Plainfield, N. J.	80,000	100	—	105
Perth Amboy		25	—	95
Pittsfield, Mass			120	130
Rochester, N. Y.		50	70	80
" Citizens		100	50	60
Rondout & Kingston			75	80
St. Louis Missouri	600 000	50	72	75
Stillwater, Minn	50,000	50	—	26
Saugerties, N. Y	15,000	100	95	100
San Francisco Gas-Co., S. Fr'isco Cal.			95	95¼
Toledo, Ohio			95	97
Troy, Citizens	600,000	100	—	60
Washington, D. C.	1,500,000	20	170	185
" Scrip	500,000	20	100	110
Woonsocket, R. I.	150,000	100	80	...
Wilmington, Del.		50	174	...
Yonkers		50	—	70

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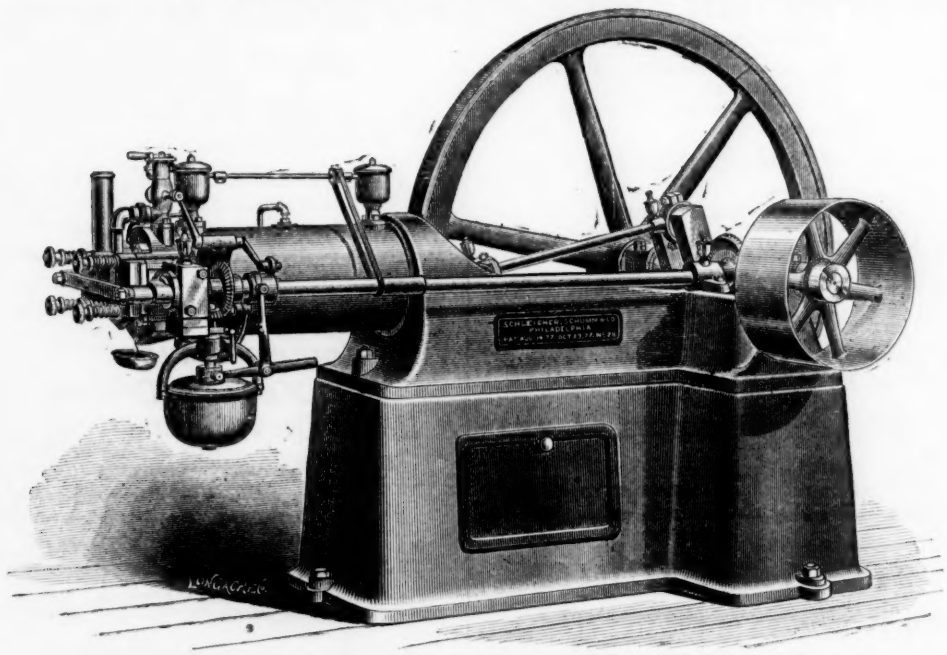

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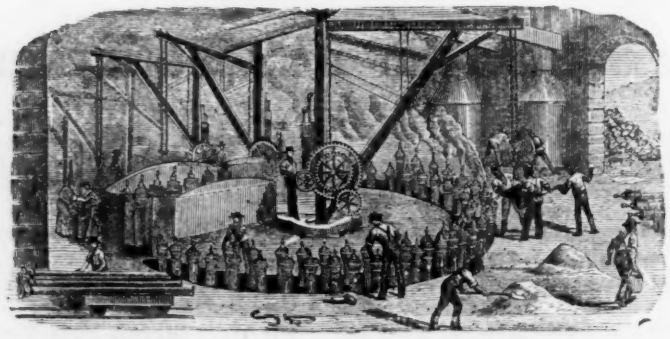

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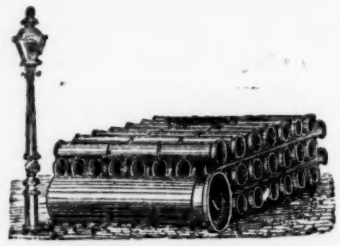

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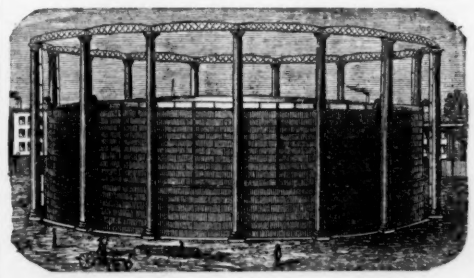

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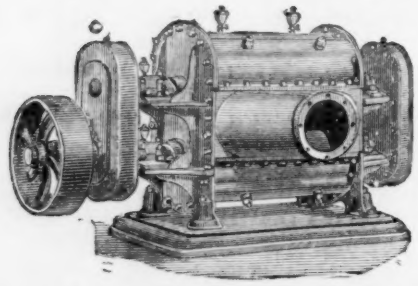

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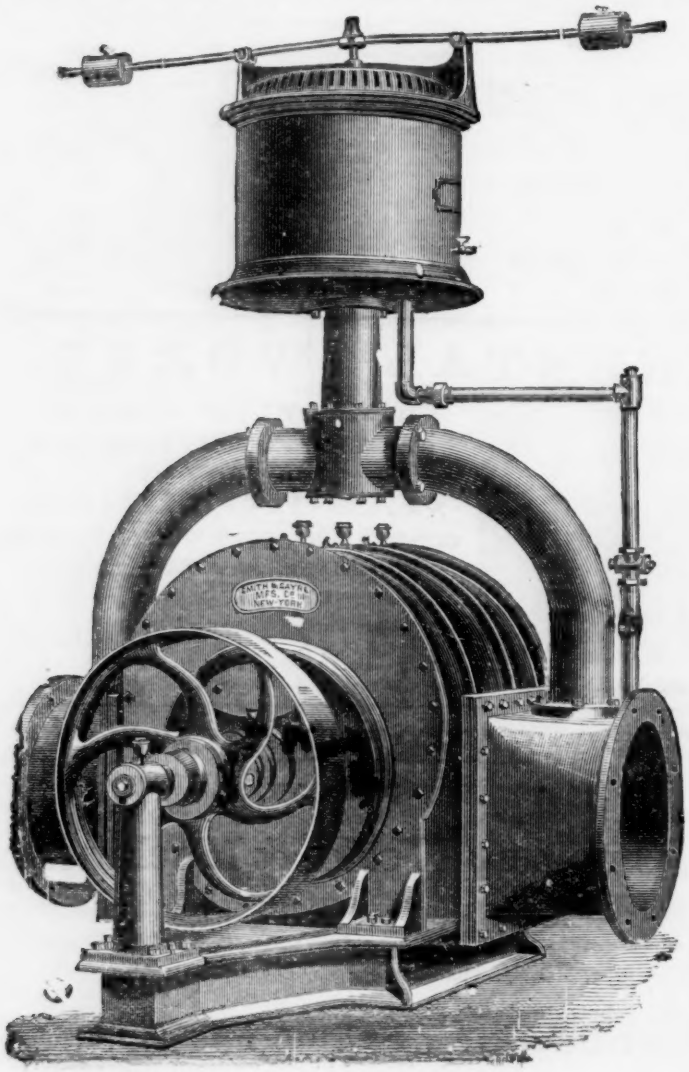

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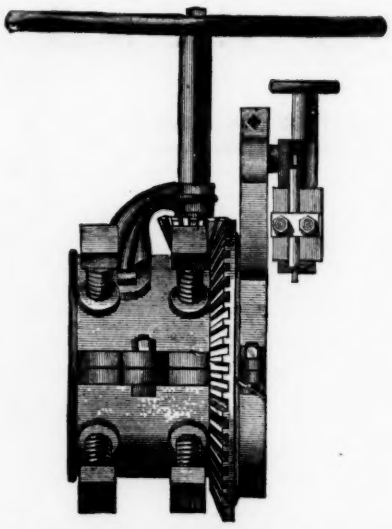

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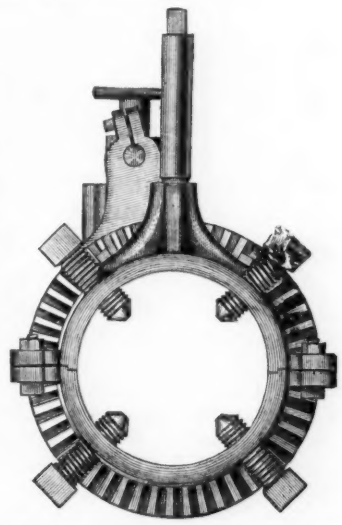

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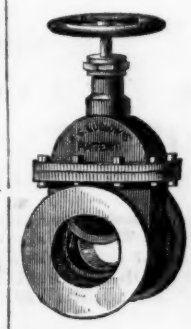

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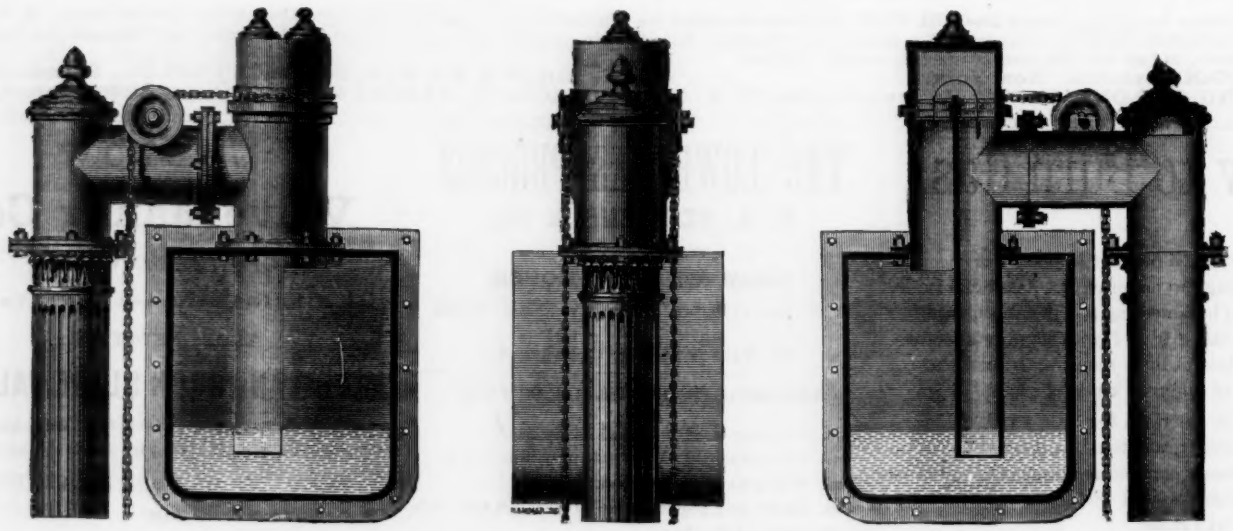

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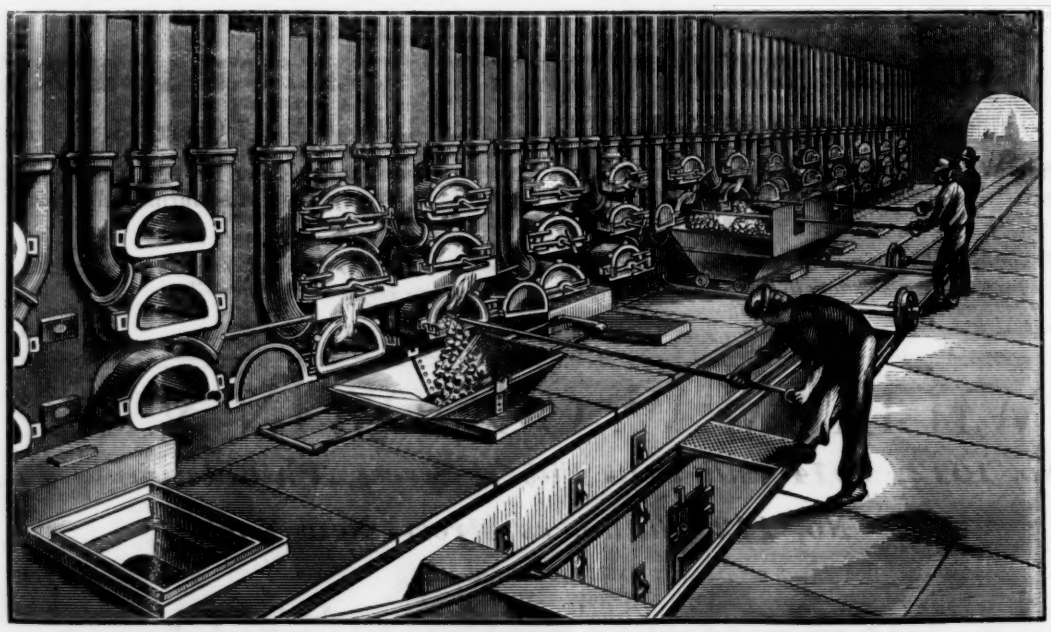

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